APR 1 1945

telephony

The Journal of the Telephone Industry

It will pay you
to discuss TODAY
your Dial
Equipment Needs
of TOMORROW
ARMY
E
NAVY

WANTED---

IDEAS AND INVENTIONS

FOR POSTWAR PRODUCTS

Automatic Electric Company, originator of the dial telephone and leading manufacturer in the field of communication and electrical remote control, seeks to make contact with inventors and others who may have patentable ideas or inventions for sale or license. Objective is the acquisition of newly invented or improved products which have peacetime application, which will make use of the company's expanded productive capacity, and which will help to maintain employment for its engineering, production and sales personnel during the postwar period.

Inventions should relate to wire communication, point-to-point radio, electrical remote control, or to mechanical, electrical or electronic devices used in such systems, and replies should be addressed to Mr. C. S. Cadwell, vice-president. All ideas submitted will be given careful consideration and treated with the utmost confidence.

Automatic Electric Company

1033 West Van Buren Street

Chicago 7, Illinois

TELEPHONY

The Journal of the Telephone Industry

APRIL 14, 1945

Contents

ABC OF THE TELEPHONE—Part IX..... 13
By Frank E. Lee

IN THE NATION'S CAPITAL—*By Francis X. Welch*.. 18

THE PLANT MAN'S NOTEBOOK—*By Ray Blain*..... 26

COURTS AND COMMISSIONS..... 28

USITA COMMITTEE TO STUDY SMALL COMPANY FINANCING 32

THE OPERATOR'S CORNER—*By Mayme Workman*... 34

IOWA SMALL COMPANIES DISCUSS RURAL SERVICE 36

H. D. FARGO, JR. — *President and Advertising Manager*
R. C. RENO — *Vice-President and Editor*
H. D. FARGO — *Vice-President and Treasurer*
A. J. STULTS — *Secretary and Western Manager*
RAY BLAIN — *Technical Editor*
FRANCIS X. WELCH — *Washington Editor*
MAYME WORKMAN — *Traffic Editor*
MARION EQUI — *News Editor*

Published by
TELEPHONY PUBLISHING CORP.
Telephone Wabash 2435
608 S. Dearborn St., CHICAGO (5), Ill.
U. S. A.

Vol. 128, No. 15. Published every week on Saturday by TELEPHONY PUBLISHING CORPORATION, 608 South Dearborn St., Chicago (5), Ill. 15 cents per copy (except special issues). Subscription $3.00 per year U. S. and Countries in U. S. Spanish Postal Zone; $4 Canada; $5 Other Countries. Entered as second class matter September 4, 1908, at the Post Office at Chicago, Ill.

THE MAGNETIC PATH

The steel alloys used to insure the most effective Magnetic Paths within the Frame are again used to further develop the magnetic circuit for each individual coil.

Each POLE PIECE is slipped over the threaded extension on its particular core. It is held here in exact relationship with the other parts by the Alignment Bracket.

We can now see further details of construction which vary considerably from the time-honored methods used in telephone relay manufacture.

New ideas, new materials, new designs, new processes, all are essential to provide the last word in telephone systems.

The NORTH ELECTRIC MFG. COMPANY
Galion • Ohio

April 9th, 1945

MEMBERS OF THE TELEPHONE INDUSTRY:

The Management of the North Electric Manufacturing Company have become aware of rumors and have been specifically informed of statements by persons in positions of authority, that the corporate entity of The North Electric Manufacturing Company, the stock control and ownership, and the officers have passed under the control of other interests.

The fact is that during the last twenty years there has been no change of ownership of the corporate entity of The North Electric Manufacturing Company, no sale or contract to sell the controlling stock ownership, no change in the majority voting control of the Company, no change in the essential personnel of voting control, no change in the essential relations between the Company and its customers the Independent Operating Companies, no change in the policies of the Company, no change in the principal officers, and none is contemplated for the future.

The North Company, as heretofore, recognizes the essential continuity through decades of standards, design and production for the Independent Operating Companies and its policy is still to maintain such service for the telephone industry.

F. R. McBERTY,
President

THE NORTH ELECTRIC MFG. COMPANY, GALION, OHIO

PHILCO

gives you the latest in Modern Telephone Battery Design!

FOR THE SPECIAL needs of the Telephone Industry, Philco provides the famous Floté element. This basically different battery, with its longer-lasting grid cast in a new high-efficiency metal marks a major advance by eliminating low cells in full float service, by reducing maintenance and charging costs, and by materially increasing battery life. Providing high capacity, compactness, toughness and long trouble-free service, Philco Floté is widely rated as the standard Telephone Battery. It is available in modern steel glass, rubber and Vitrabloc jars—in capacities and sizes for all central station and PBX operations. Write for latest catalogs. PHILCO CORPORATION, Storage Battery Division, Trenton 7, New Jersey. *Makers of the Famous Philco "Thirty".*

For 50 years a leader in Industrial Storage Battery Development

ABC of the Telephone

By FRANK E. LEE

PART IX. Anti-Sidetone Circuits. The eighth article in this series appeared in the March 3 issue, page 13.

SIDETONE is the current developed in the receiver as the result of speech or noise voltages generated in the transmitter of the same set. Sidetone effects are noticeable in all telephone instrument circuits—some more than others. In the standard sidetone or booster circuit, the sidetone is very noticeable and under certain conditions proves a definite detriment to overall transmission. Locations where room or other extraneous noise is a marked degree above normal conditions bring out this disadvantage of the booster circuit. Still another fault must be charged to the sidetone circuit. Transmission efficiency is lowered because the speaker (hearing his own words) unconsciously lowers his voice, resulting in a weakened signal in the circuit.

Several circuits have been designed which reduce the effects of sidetone measurably. Circuits engineered and built for this purpose are called *anti-sidetone circuits.* In an anti-sidetone circuit there are two requirements that must be met if the overall efficiency is to equal that of the ideal invariable circuit.

(1) When the circuit is transmitting or sending, there should be no current through the receiver.

(2) When the circuit is receiving, there should be no dissipation or loss of energy in the balancing network.

These requirements were stated by G. A. Campbell in his paper on the transaction of the American Institute of Electrical Engineers for 1920. It is quite obvious that the two conditions set forth can be only partially realized under practical conditions.

From this it is apparent that the anti-sidetone circuit must retain the essentials of the booster circuit plus an additional balancing element. In the discussion of typical anti-sidetone circuits that follows, it will be noted this balancing element consists of inductance and resistance in series, or of inductance, resistance and capacitance in series. In practice, the inductance of the balancing element is a third winding on the induction coil, the capacitance is a condenser, and the resistance is either a resistance unit or resistance incorporated in this portion of the network by making the third winding from high resistance wire.

The balancing network acts as a "one-way" valve, allowing the receiver to operate only on an incoming signal and not when the circuit is sending. When the circuit is sending, the source of electromotive force (EMF) is the transmitter. During the sending period, the circuit action is most easily understood by regarding the transmitter as an alternating current generator, having a constant resistance and producing an EMF. In this light, the transmitter definitely is considered the source of energy causing the action when the circuit is sending. The substitution is justified fully on engineering and mathematical grounds.

The anti-sidetone circuits of the dif-

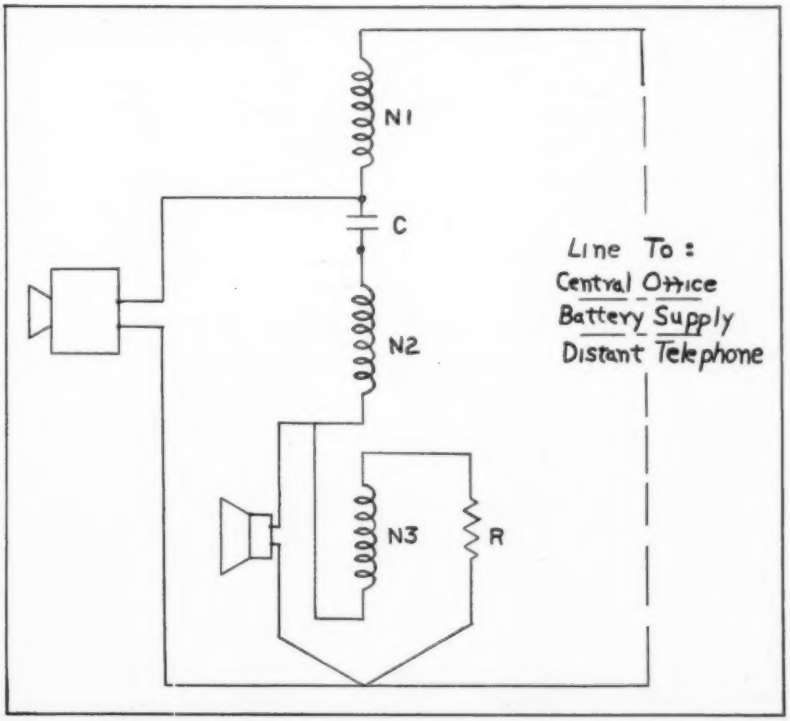


FIG. 1.

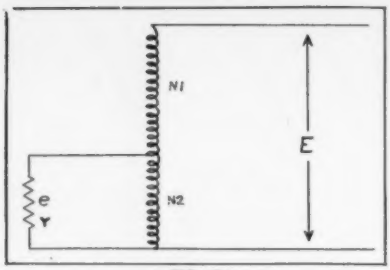


FIG. 2.

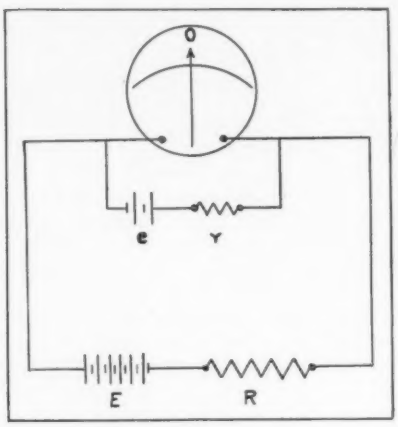


FIG. 3.

ferent manufacturers practically are the same. However, variations do exist in the proportion of the induction coil windings to one another and in the theory of the individual circuits. The following descriptions are only approximations intended to give an introduction to what is taking place in the circuit.

It must be remembered that the task of expounding or discussing a theory does not necessarily involve the selection of an idea as being better than another similar idea. With this thought in mind it will be seen the author's only intention is the dissemination of information on anti-sidetone instrument circuits in general.

Description A

A basic circuit used for purposes of voice transmission is shown in *Fig. 1*. The induction coil has three windings, N1, N2 and N3. The letter "N" is used to indicate that a certain number of turns are involved in the construction of each winding. As drawn they have the same polarity. This indicates they are wound on the core in the same direction. The drawing reveals clearly the reversal of N3, the balance winding. The condenser "C" may be as large as

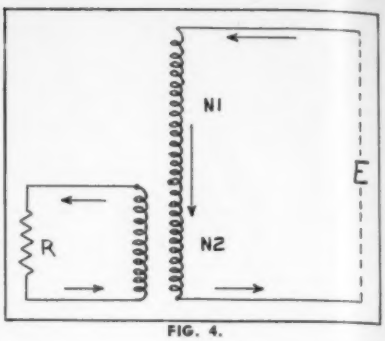


FIG. 4.

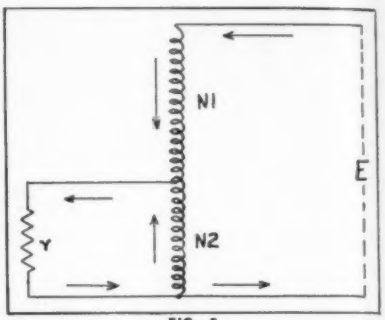


FIG. 5.

desired, in some respects, the larger the better so its reactance, or tendency to diminish the current, may be practically neglected.

The condenser serves a dual purpose in the circuit. First, it is a simple filter to guide the direct current into the transmitter and not into the receiver part of the network. Second, it acts as a circuit balance to counteract the self-inductance in the receiver. The resistance "R" acts as an artificial line, upon whose value the anti-sidetone action depends.

SENDING: The voice of the speaker causes the resistance of the transmitter to increase and decrease. This creates a corresponding rise and fall in the value of the direct current in the line circuit. This, alone, would send speech current to the distant telephone, but the signal would be weak. The induction coil, acting as an autotransformer, greatly increases the strength of the signal. An autotransformer, *Fig 2*, combines the primary and secondary into a single coil. To step-up the voltage, as a booster, part of the coil is used as primary and all as secondary. To step down the voltage, all the coil is used as primary and part as secondary.

If the transmitter is considered as a source of energy, an alternating current generator with a fixed resistance (see condenser connected across a variable resistance in a previous installment), the EMF "e" sends current into winding N2. Because both N2 and N1 are on the same iron core, the EMF

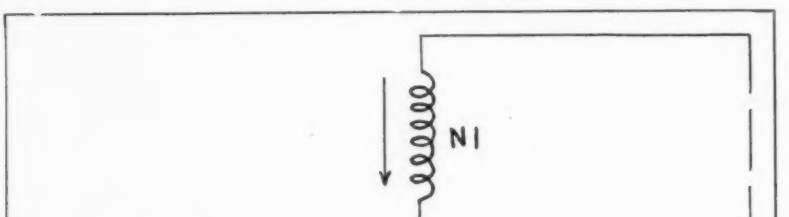


FIG. 6.

"E" delivered to the line is greater than the EMF "e." In this instance, the autotransformer is used as a booster. It is possible to choose a ratio of turns between N1 and N2 so that, under average conditions, the transmitter will deliver its maximum energy to the line.

The anti-sidetone action of the network is given by the reversely connected winding N3 and its associated resistor "R." These units are connected in parallel with the receiver and, therefore, are in that portion of the network connected to the primary portion of the autotransformer. During the *sending* of speech, this winding generates an EMF which tends to neutralize the currents through the receiver by the transmitter. The neutralization occurs only in the receiver, across which the winding is connected, and does not affect the current in the other portions of the circuit. In effect, winding N3 tends to lead the current in the circuit around the receiver, instead of through it.

The nearest easily understood network is one which often is used to keep a galvanometer at zero deflection even

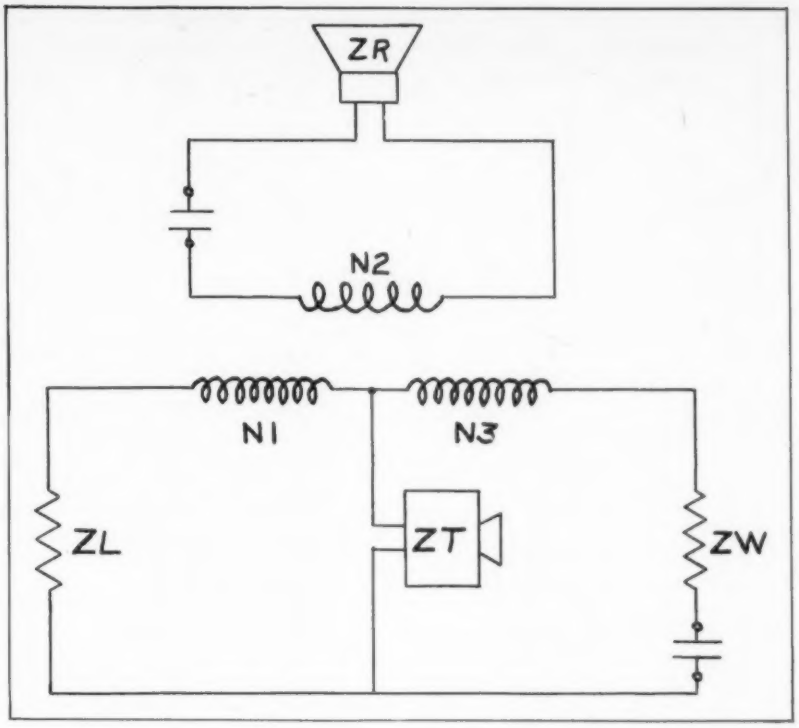


FIG. 7.

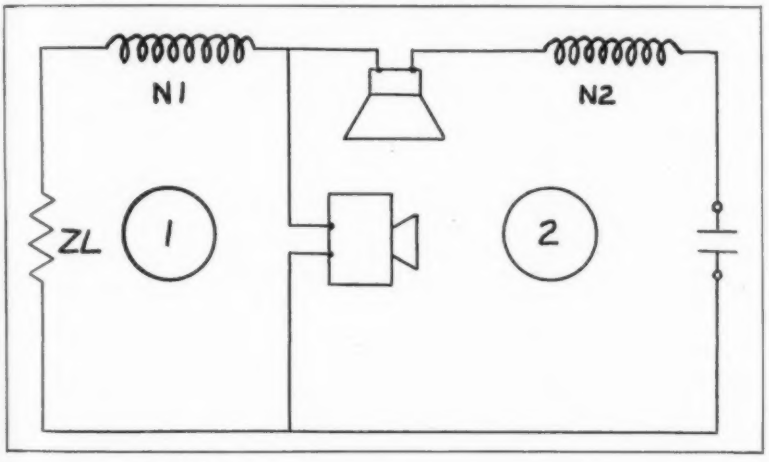


FIG. 8.

though it is connected in a direct current circuit. In *Fig 3*, the main battery "E" sends current "I" through the resistance "R." Normally, this would deflect the galvanometer far from zero. However, it is possible to adjust the value of the little battery "e" and its resistor "r" so as to lead the current "I" around the galvanometer, but not through it. The galvanometer will remain at zero. Obviously, the action of winding N3 is not as simple as the direct current example, but the general idea is the same.

RECEIVING: During the receiving period of voice transmission a different source of EMF operates the network. The currents originate from the line and a superimposed current (a current with AC characteristics) flows through the receiver and also through the transmitter. In fact, it is because of current flow through the transmitter that the receiver gets most of its current.

A regular insulating transformer is shown in *Fig. 4*. An EMF "E" in the line circuit drives alternating current through the high winding (the winding with greatest number of turns). Current will be induced in the low winding and its fixed load "r." The load "r" represents the transmitter with a fixed resistance when the diaphragm is in a normal position. Further, note that the

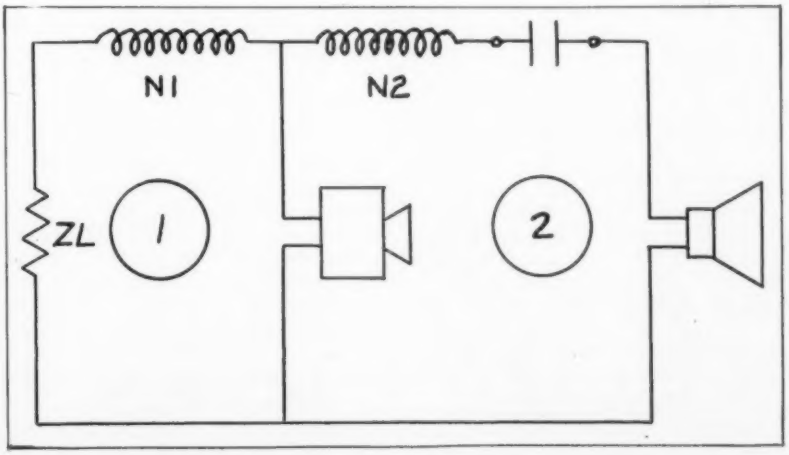


FIG. 9.

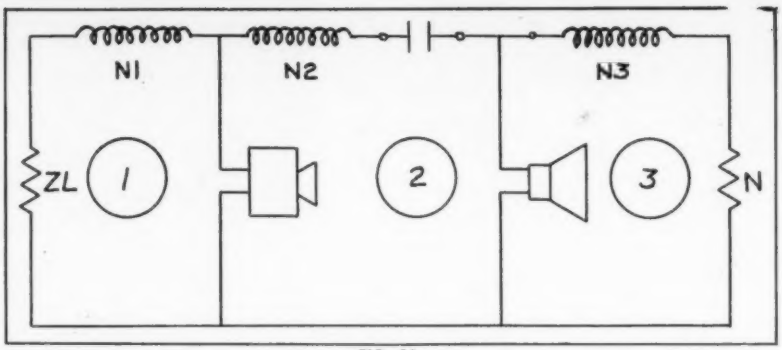


FIG. 10.

direction of the current in the low winding is opposite to that of the current in the high winding. In the telephone circuit the load "r" is relatively small so that its current is relatively large.

The windings of the insulating transformer have been merged in *Fig. 5* to make an autotransformer. In the winding N2 the local load current predominates over the incoming line current. As a result, the current in N2 will be the difference between the local load current and the incoming line current.

Now insert the receiver and other units of the original network, *Fig. 6*. The current in the receiver portion of the network is due mainly to the current that the transmitter gets in its position of "load." Also, it will be noted the current in winding N2 is opposite to that in N1. The voltages generated in N3 by windings N1 and N2 neutralize each other. As a result, current does not flow in the balancing network at this time. To emphasize this feature of the network when receiving, the balancing network has been omitted from *Fig. 6*.

Description B

In the anti-sidetone circuit shown in *Fig. 7*, the balancing element ZW is connected across the transmitter terminals instead of across the receiver. The balancing element consists of a resistance and capacity (condenser) in series. The resistance, itself, is incorporated in the winding N3 by building this winding out of higher resistance wire. The other coil windings are designated as N1 and N2.

In any circuit or network, certain units offer impedance or resistance to the flow of current. In this illustration the other impedance units beginning with the letter Z designation are: ZR, the receiver; ZT, the transmitter, and ZL, the line. Comparing the induction coil to a transformer, this coil would be considered an insulating type.

SENDING: Consider the circuit diagram under transmitting or sending conditions, that is, with the transmitter acting as the source of EMF. In this case the resultant current will flow through both ZW and ZL. The current flow through ZL is obvious because that is the source of line battery supplying the transmitter. The current through ZW primarily results from oscillations of the condenser connected across the terminals of the transmitter.

Windings N1 and N3 are wound in the same direction on the core. The currents generated by the transmitter (remember the transmitter can be considered as an alternative current generator) will be opposing and will produce no flux (magnetic field) in the core. This statement is true if windings N1 and N3 are equal and if the balancing element, ZW, has the same impedance as the impedance of ZL, the subscriber's line. There will not be any EMF generated in N2, therefore, the receiver will not operate. This fulfills the first requirement of the anti-sidetone circuit—when the circuit is transmitting, there should be no current through the receiver.

Obviously, it is impossible to match this line impedance exactly with as simple a device as a single resistance and capacity in series. For one particular combination of all factors this objective is theoretically possible. However, the line impedances themselves are variable, depending on the length and general makeup of the subscriber's loops.

A supplementary winding, not shown on the diagram, will permit some adjustment of the balancing coil to variations of the subscriber's loop. The additional winding should be in the form of a non-inductive winding, which is one that does not create a magnetic field. This enables changes to be made in the resistance of ZW and not in the inductance of N3. To change the inductance factor of N3 would result in a change in the equality ratio that should exist between N1 and N3.

Nevertheless, only an approximate balance ordinarily may be obtained and some current will flow through the receiver. This, however, will be small and will constitute a very considerable reduction in sidetone.

It will be noted that a portion of the energy from the transmitter is dissipated in the balancing network (N3 and ZW). A comparable loss also appears in any sidetone circuit. In the sidetone circuit the loss is in the receiver circuit, instead of in the balancing network. This loss is inherent in any invariable circuit for two-way transmission.

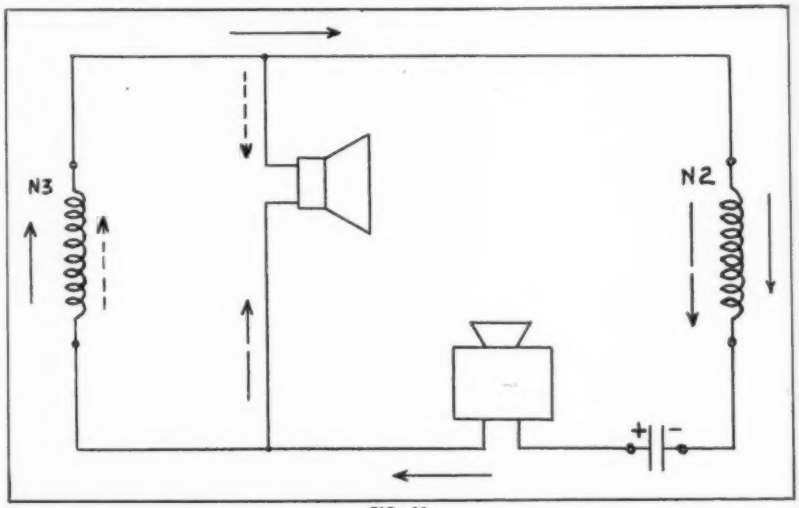


FIG. 11.

RECEIVING: For the receiving condition the source of EMF operating the network is originated in ZL, the line. The resultant current flow through windings N1 and N3 of the induction coil will be in the same or aiding direction. The change in the flux of the core will induce current in winding N2. As a result, current will flow in the

receiver circuit. Note that under these conditions windings N1 and N3 are shunted at their common terminal by the transmitter. More current will flow through N1 than through N3. Actually, this condition is necessary to secure an approach to the second requirement of the ideal anti-sidetone circuit. The impedance of the balancing network, being several times larger than that of the transmitter, results in a relatively small energy dissipation in the balancing network.

Description C

The sidetone, or booster circuit, may be drawn as indicated in *Fig. 8*. The primary, or transmitter circuit, designated No. 1, includes the transmitter, winding N1, and the line impedance. The secondary or receiver circuit, No. 2, includes the transmitter, condenser, winding N2 and the receiver. A mesh represents the closed figure produced by joining coils successively, end to end. This circuit drawing follows along that same general pattern, therefore, the separate sections of the complete network may be termed as individual meshes.

By merely rearranging the order of the elements in No. 2, the circuit may be drawn according to *Fig. 9*. The rearranged circuit retains all of the features of the booster circuits. Nothing has been taken from or added to the original circuit.

The reason behind the rearrangement of the original circuit becomes apparent when the balancing element, No. 3, is added to form the anti-sidetone circuit, *Fig. 10*. The symmetry of the circuit has been retained and the circuit analysis can be followed more readily.

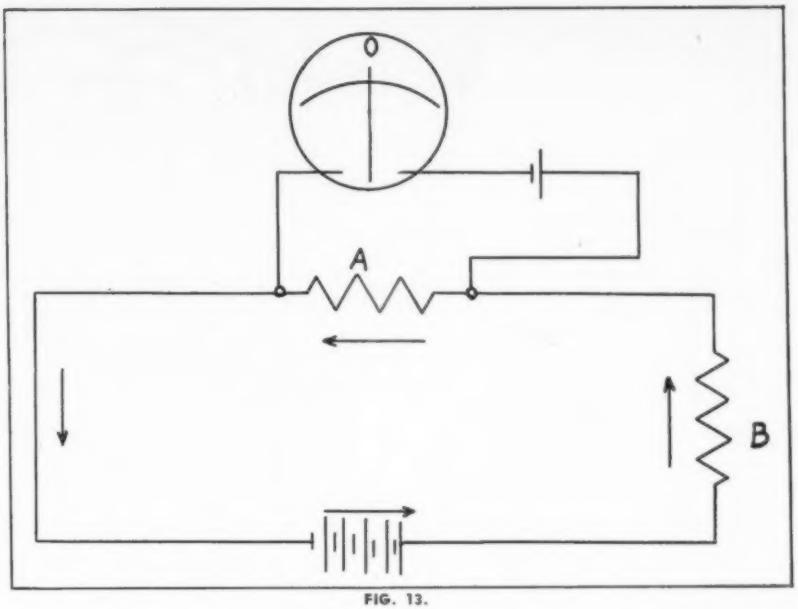


FIG. 13.

SENDING: As in the preceding descriptions, the transmitter is the source of energy or voltage during the sending interval. Not only does the transmitter vary the strength of the line current, but also the booster effect is superimposed upon the line current because of oscillations in No. 2. Primarily, these oscillations are the result of the condenser charging and discharging. Further, it will be noted the balancing elements are in parallel with the receiver. Simultaneous with the condenser oscillation passing through No. 3, a current is induced in winding N3 because of the current in N2. The voltage created in N3 flows through the receiver in an opposite direction to the original condenser oscillation. The final result—current flows through N2 and N3 to charge and discharge the condenser without affecting the receiver. The effective voltage in the receiver is zero, therefore, the receiver will not operate when the network is sending.

Fig. 11 illustrates how the condenser can charge and discharge through N2 and N3 without energizing the receiver. The broken arrow represents the current flowing through N2 because of the condenser oscillation, and the dotted arrow, the voltage generated in N3. The currents flowing through the common parallel path and the receiver are opposing, therefore, there will be no change in the magnetic field of the receiver. The network is designed and engineered to create this condition in No. 3 only when the transmitter is in operation.

RECEIVING: For the receiving condition the effective EMF is found in No. 1. The current in winding N1 induces voltages in both N2 and N3. The voltage created in N2 operates the receiver. It will be noted the receiver and transmitter make up the load in No. 2. Consequently, there is a voltage drop across both the transmitter and the receiver. During the receiving interval the EMF induced in N3 approximately is equal to the drop in potential across the receiver caused by the current in No. 2.

A similar circuit is shown in *Fig. 12*. The galvanometer indicates there is a certain potential drop across resistance "A." It will be noted unit "A" forms only a portion of the total resistance in the circuit. By adding a small bat-

(Please turn to page 40)

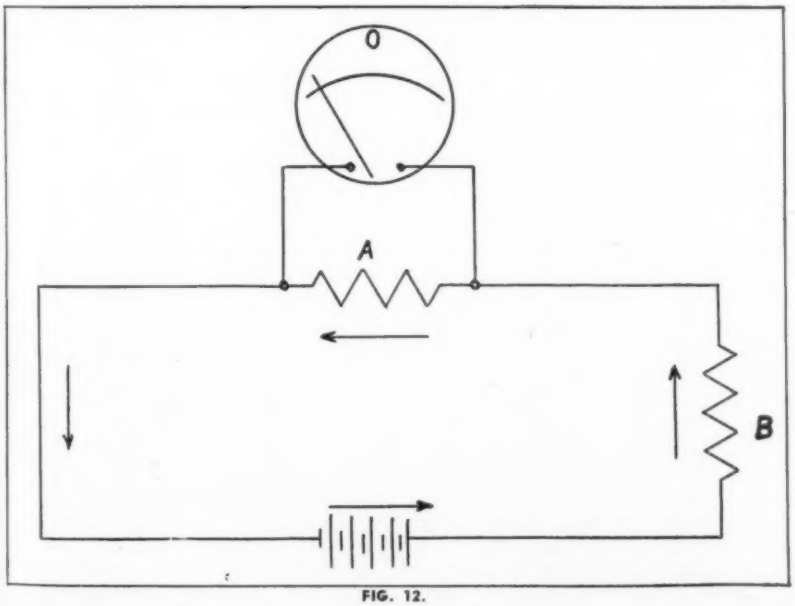


FIG. 12.

With favorable outlook of European war, WPB should consider plan for resumption of manufacture of some civilian telephone equipment. . . . International communications merger legislation unlikely. . . . Some Supreme Court justices now not so sure about Hope Natural Gas decision.

SPRING optimism over an early end of the European war has taken the form of new emphasis on plans for resuming civilian goods production. True, General Eisenhower has warned us, in effect, to go slow. At the time Eisenhower told President Roosevelt that a clean-cut, wholesale surrender of the German military could not be expected with any degree of certainty, there still remained to be accounted for, plenty of stinkers between the Oder and Cologne.

But even normally conservative, extra-cautious government officials have not gotten to the point where it is realized that a practical, if not formal, cessation of hostilities in Europe is now only a matter of a few weeks, if not days. That being so, it is only common sense to start the preliminary machinery in action for picking up at least part of our long-deferred backlog of civilian goods production so that VE-day, whenever it arrives, will not catch us entirely with our plants down.

This week the WPB Radio & Radar Division held quite a confab within its own organization on taking steps to resume the manufacture of civilian radio equipment of all kinds. There is a tremendous backlog of demand for new radio sets for the home front to replace sets which have gone out of commission. More important, from the standpoint of priority, is the need of police, safety and utility services throughout the country, for radio communication facilities, tubes and other replacement and repair parts. The WPB Radio & Radar Division tentatively adopted a program which calls for its submission to the Radio-Radar Industry Advisory Committee just as soon as the actual end of hostilities in Europe is in sight.

Details were not made public, of course, but it is understood the release of materials, manpower, and manufacturing equipment will be channeled first to the resumption of emergency equipment facilities for police, safety, and health agencies; next for commercial communication and transportation agencies, including commercial air lines, and finally for the army of citizens who want new radios or—as in many cases—simply a radio set. Civilian demands for radio sets alone are estimated to run well over the 2,000,000 mark.

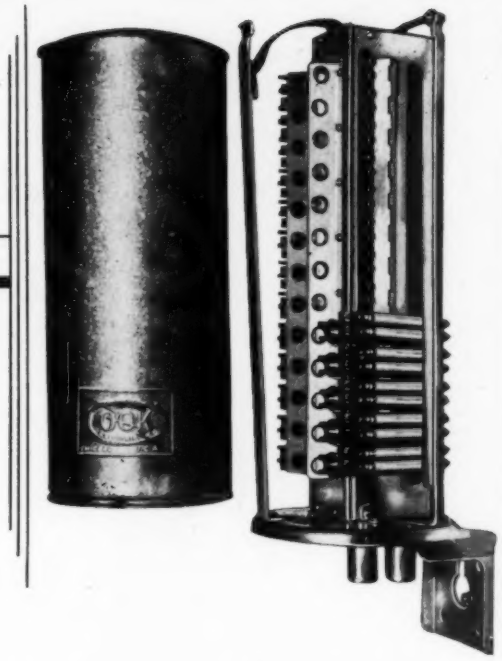
WPB Chairman "Cap" Krug, who usually is pretty careful about what he says, has gone so far as to promise that civilian radios definitely will be out "by the end of the year."

On April 19 there is scheduled a meeting of the WPB Telephone Operations Industry Advisory Committee. It is quite likely that the WPB Communications Division will have ready, in time for submission to the committee, a similar program outlining the prospective tempo for resuming civilian production in the telephone field. But because the demands of the military and the shortage of manpower are likely to persist through the summer, the operating telephone industry cannot expect too much too soon. A trickle of returning veterans, discharged for one reason or another, may ease the labor shortage generally during the coming summer months.

But these discharged veteran groups are likely to include relatively few experienced hands for the telephone manufacturing industry. It is such a specialized and technical industry that it will take longer for the general easing of labor shortage to work up to the point where it will be felt. Eventually it *will* be felt, of course. But, for obvious reasons, not nearly so promptly as less specialized lines, such as farming, trucking, retail services, and so forth.

The Western Electric plant in the St. Paul area still is operating under the tightest labor conditions yet experienced. Independent manufacturers generally have been so swamped with

UA-20



Aerial to Underground
CABLE TERMINAL

by COOK

The UA-20 closely resembles the design of the famous Cook S-20 Pole Cable Terminal. The UA-20 is equipped with two entering nozzles and the cable chamber is equipped with terminating studs for each cable. Protection is provided by the Dual Gap H-20 Protector Unit which connects each aerial cable pair with its adjacent underground pair.

The UA-20 offers many advantages. By simply removing the fuses the overhead and the underground cables are quickly disconnected, permitting testing in either direction. Special test clips with fuse clip adapters and cords are furnished. Service is re-established by reinserting the fuses into the heavy spring clips, which insures constant electrical contact and no resistance loss, an important feature in toll cable transmission.

ARMY (E) NAVY

COOK ELECTRIC Company

2700 SOUTHPORT AVENUE • CHICAGO 14, ILLINOIS

work on orders for the armed forces that they have been unable, so far, to produce even the limited quotas allowed for civilian telephone set manufacture by the WPB order of last fall.

* * *

The Senate Interstate Commerce Committee hearings on the proposed merger of international communication interests are beginning to take on more the appearance of an inquest. At this writing, only the five principally interested government agencies have been heard from, and none of the industrial or labor witnesses. Yet it was apparent from the demeanor of Senator Wheeler (D., Mont.), chairman of the committee, and the other senators, that while they continued to go through the motions of legislative progress of a proposed merger bill, they actually were conducting a wake for the same. Indeed, some of the testimony of the government witnesses might have been summed up (with reference to the proposed merger) in the famous remark attributed by Shakespeare to Mark Antony, "I come to bury Caesar, not to praise him."

Observers were inclined to credit the state department witness, Francis Cold de Wolf, with administering the final *coup de grace* which ended all chance of compulsory merger legislation at this session of Congress. Even before that, in fact ever since the Navy Department brought in its surprisingly ambitious program for forcing all sorts of international communications services, including telephones, into a single basket tied up with government red tape, there was noticeable, figuratively speaking, a peculiar odor pervading the hearings as if something were expiring, if not expired.

Specifically, what killed the merger bill was the inability of the five government agencies to agree on what kind of a bill was wanted. The Senate committee has doubtless lost patience and is showing a reaction to the effect that "If you people, who are supposed to be experts, can't agree among yourselves as to what you want, how can you expect us to legislate?"

Probably the chief responsibility for the fiasco must be laid at the door of the Navy Department for shooting too high. It will be recalled that the Navy plan, proposed on the opening day of the Senate Committee hearings, provided for a compulsory merger of all American interests in international communications of every sort, including commercial radio and cables, telephones, aviation, and even the press radio services used for news gathering. This mandatory combination was to be administered by a corporation monopoly, in the management of which the federal government actually would participate to the extent of being represented by five of the 20 proposed directors.

"Can you speak a little louder—my wife can hardly hear you!"

The plan was announced by the head of naval communications, Adm. Joseph R. Redman, who was (and is) doubtless sincere in his expressed conviction that such an arrangement would be the best possible solution. Redman's titular boss, Secretary of the Navy Forrestal, appeared to give somewhat halting approval, as if he (Forrestal) were not in his own mind entirely convinced.

Next, it will be recalled, came the Federal Communications Commission's chairman, Paul Porter, who shot away at the idea of a mixed corporation, in which the government would participate. Next appeared the Civil Aeronautics Authority witness, Charles I. Stanton, who protested against the inclusion of diverse types of communication facilities in the same operating combination. Telephone and aeronautical radio, as well as press wireless facilities, ought to retain independent status, Stanton argued.

The Army's position indicated apathy towards the whole business. In short, the Army took no positive stand for anything suggested. As far as the Army was concerned, it could live with any reasonable arrangement. It gave the general impression that the compulsory merger bill was the Navy's baby and if its sister branch of the service was stuck with it, there was no reason for getting the Army involved.

The state department witness was the most forthright of all. The state department wants no merger whatever. But if there has to be a merger, state would agree with the Civil Aeronautics Authority that dissimilar communication services (such as telephones and cables) ought to be kept on an independent, if not competitive basis in the interest of generally good public service.

So we see that of the five government departments, no two viewpoints were exactly alike. (Nearest to agreement were the state department and the Civil Aeronautics Authority.)

It is likely that Senator Wheeler will go on with hearings of the other witnesses representing commercial interests and labor unions after the government testimony has been printed or digested. One government exhibit still to be made public is a valuation breakdown of the Army's own communication service, variously estimated at between $175,000,000 and $250,000,000, located practically all over the world.

Maj. Gen. Harry C. Ingles, Chief Signal Officer, is expected to produce a breakdown analysis which would

Perfect

"AERIAL STRATEGY"

When you're planning to install aerial cable, use of GENERAL cable is perfect strategy. In the wide line of GENERAL cables, you'll find just the cable you need for any specific job. And whichever type you choose, you may be certain that every GENERAL cable fully meets the recognized high standards of the telephone industry. Into these cables is built every characteristic which makes for the greatest ease of handling, the finest of transmission quality, and the permanence which assures a practically trouble-free plant.

GENERAL Cable can be supplied, now, only for absolutely essential requirements. But when you *must* buy cable, be sure you get the protection of GENERAL CABLE quality. Standard types and sizes shown in Automatic Electric Catalog No. 6000—made also in the new, copper-saving 26-gauge sizes (information on request).

GENERAL CABLE
GENERAL CABLE
GENERAL CABLE

GENERAL CABLE
TELEPHONE WIRES AND CABLES

DISTRIBUTED BY

AUTOMATIC ELECTRIC
SALES CORPORATION

4033 WEST VAN BUREN STREET • CHICAGO 7, ILLINOIS

specify what portion of this military equipment (doubtless only a comparative fraction) could be used after the war for commercial operation. Some of the senators, notably McFarland (D., Ariz.) and White (R., Me.), seem to be hopeful that some sort of a merger plan can be salvaged from the present rubble of conflicting testimony. But if this is so, it probably will be a very different plan from the radical proposal originally advanced by the Navy.

Chairman Wheeler called all the government department witnesses into an executive session on April 4, at which he, McFarland, White and Senator Capehart (R., Ind.) were present. There is a rumor that the Justice Department, which has always been suspicious of monopolies, whether domestic or international (international monopolies generally being called cartels), might offer its services in rigging up a merger plan which would keep the telephones, cables, press wireless and aviation radio on separate and independent planes of operation. But this was only a rumor.

In view of the heavy schedule of other work ahead for the Senate Interstate Commerce Committee, and making due allowance for a probable summer recess and post-European war legislative requirements, it would take a braver prophet than this writer to predict that a new bill could be drawn, worked over by the Senate committee, approved by the Senate and go through the same process in the House before the final bell rings on the congressional session of 1945 next December. It could happen, of course, if enough steam were developed. So far there is not even such a bill in the hopper.

* * *

Something strange is going on in the U. S. Supreme Court with respect to the trend of decisions regarding public utility rate regulation. In a word, the Supreme Court seems to be going through a pretty agonizing soul-searching experience. The trouble apparently stems from the Hope Natural Gas decision handed down early last year.

It will be recalled that, in the Hope Natural Gas decision, a robust majority of the court just about swept clean the old precedents about judicial review of commission rate fixing which were anchored on an old 1898 decision in the case of Smyth vs. Ames. In the Hope case, the court decided it was no longer going to be worried about methods or formulas used by a federal or state commission as long as the "end result" could not be shown to have injured the utility company involved to the point of confiscation. This Hope decision set the state and federal commissions up as pretty complete masters of their own methods. As a result of this new independence of action, at least one commission, the Federal Power Commission, has been throwing its weight around in such a way that the Supreme Court noticeably is disturbed.

Last week the court handed down four natural gas rate decisions, all upholding Federal Power Commission rate orders. In the principal case, however, the FPC was upheld by only the narrowest of margins. The new right wing of the court, numbering four justices (Chief Justice Stone, and Justices Frankfurter, Reed and Roberts) flatly stated that they thought the FPC had abused its regulatory discretion by assuming jurisdiction over certain utility properties for rate-making purposes which were specifically excluded by the Natural Gas Act (under which the FPC purported to act). A fifth member of the court, Justice Jackson, who could have just as easily swung the decision the other way and reversed the FPC, clearly showed that he is on the fence and none too happy about it.

Justice Jackson blamed the Hope Natural Gas case decision whereby the majority of the court virtually abdicated its right to review regulatory methods as distinguished from regulatory results. But Jackson decided to go along with the majority in the Colorado Interstate Gas case by the slender thread of the precedent in the Hope Natural Gas case, even though he avowedly disagreed, and still disagrees, with the Hope Natural Gas case, itself. Here is a noteworthy passage from Jackson's special concurring opinion in the Colorado Interstate case. Referring to the Hope Natural Gas case, Jackson said:

"This case introduced into judicial review of administrative action the philosophy that the end justifies the means. I had been taught to regard that as questionable philosophy, so I dissented and still adhere to that dissent. But it is the law of this court, and I do not understand that any majority is ready to reconsider it."

In view of this strange fruit of the Hope Natural Gas decision, it may well be that another revolutionary change of regulatory policy is in the process of judicial incubation. Certainly the Hope Natural Gas case has produced some pretty odd results to date.

Take these gas rate cases, for example. Section 1(b) of the Natural Gas Act specifically excludes from the jurisdiction of the FPC local "production and gathering facilities" (as distinguished from interstate pipe-line transmission facilities) of natural gas operators. Yet the FPC went right ahead and included such property items in a rate base in order to determine interstate natural gas rates. It is unnecessary here to go into the rather involved reasoning of the FPC which purported to justify this pretty patent disregard of the federal statute.

At any rate, the FPC arguments seem to make little impression on either the majority or the minority of the Supreme Court. However, the court majority, led by Justice Douglas, who wrote the opinion, pointed out that under the Hope Natural Gas case, the federal judiciary's interest in such matters is limited to a determination of whether the *results* of the rates, finally fixed, would in effect constitute a confiscation of the utility property. If they could not be shown to have such a confiscatory effect, said Douglas, still leaning heavily on the Hope Natural Gas decision, the Supreme Court is not interested in the methods employed or the formulas used in making its determination.

But here we have a case of a commission assuming jurisdiction over matters specifically excluded by statute. If this sort of arrogation of regulatory authority is to be condoned under the sweeping precedent of the Hope Natural Gas case, what is to prevent the Federal Power Commission from fixing telephone rates—which it obviously has no authority to do under any statute—as long as the telephone companies affected could not show that the "end result" was confiscatory?

This suggestion is not urged seriously, but merely as a reduction to absurdity of the extremely tenuous type of argument which has been fostered by the troublesome Hope Natural Gas decision. Small wonder that four justices seem to be in a mood to call the whole thing off, and the fifth justice is sitting on the fence scratching his head.

»» In a shop in Philadelphia, Pa., a little old lady in a funny hat, according to the New Yorker magazine, said to another little old lady in a funny hat, "Mildred, how do you work this thing?" P.S. It was a pay-station telephone.

"...oud of our telephone service"

...TROWGER AUTOMATIC of Course . . .)

IN YOUR "Hometown," too, you'll win new friends—and new subscribers—when you install Strowger Automatic equipment. Telephone users welcome the modern, convenient dial service provided by these automatic units. Local newspapers and civic organizations endorse Strowger Automatic service, for they recognize it as a vital aid to better living and better business.

You profit, also, from these unique operating advantages of Strowger Automatic Telephone Equipment:

FLEXIBILITY—Each Strowger switch is a unit in itself—a switchboard in miniature. The most complex problems of modern telephone switching are simply solved by combining these units.

EASY GROWTH—When Strowger Automatic service makes an exchange grow, it is easy to add switches to handle the additional load. Switches slip readily into place on the exchange frameworks; those previously installed are not affected.

MINIMUM MAINTENANCE—Years of development of the standardized Strowger switch mechanisms have given them exceptional sturdiness and long life. Maintenance is simple and inexpensive.

The record shows that Strowger Automatic operation has helped hundreds of Independent companies to improve public relations, increase earnings, and reduce costs. Let us give you facts and figures for your own situation.

AUTOMATIC ELECTRIC

Originators and Developers of Strowger Step-by-Step Machine Switching Automatic Dial Systems
Makers of Telephone, Signaling and Communication Apparatus . . . Electrical Engineers, Designers and Consultants

Distributors in U. S. and Possessions

AUTOMATIC ELECTRIC SALES CORPORATION, 1033 W. Van Buren St., Chicago 7, U. S. A.
Export Distributors: INTERNATIONAL AUTOMATIC ELECTRIC CORPORATION

THE PLANT MAN'S NOTEBOOK

BY RAY BLAIN • TECHNICAL EDITOR

THE JOINT Army-Navy Termination Regulation is the "bible" for war contractors to be used in the rapid settlement of war contracts. It is imperative that contractors, holding war contracts, be placed on the mailing list for this regulation and all subsequent changes. There is no charge for these publications. Contractors should write for these publications to the Joint Army-Navy Distribution Center, 90 Church St., New York City, N. Y., and copies will be forthcoming.

* * *

We are in receipt of a letter from H. M. Stewart, vice president, Telephone Services, Inc., Ft. Wayne, Ind., with reference to the old switchboard described by R. E. Blaylock on this page in the February 24 issue. "The switchboard described by Mr. Blaylock is commonly referred to as the 'Paddy Burn's Board.' I understand there are several boards of this type in service throughout the country though the only one I know, for the moment, to be in current operation is a two-position job at Atmore, Ala., owned by Minor Corman," writes Mr. Stewart.

* * *

We received the following letter from Frank D. Fancher, general manager of the Orange County Telephone Co., Middletown, N. Y.:

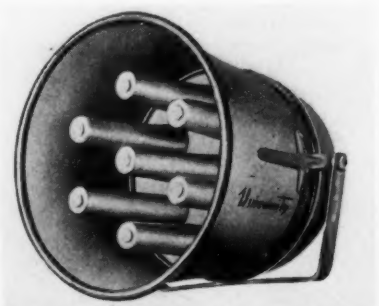
"For a number of years telephone companies have experienced considerable trouble due to the failure of the lead sheath on fairly new cables. Old cables on the same poles often do not cause nearly as much trouble. This trouble has been blamed on crystallization, faulty manufacture, new and improved compositions of the lead sheath and many other things. I have finally come to the conclusion that the real trouble is due to the use of improved equipment for pulling cable into aerial rings or underground conduit.

"In the old days cable was pulled-in either by horsepower or manpower. Then, also, we had to pull-in short sections. Today, we pull-in cable by the use of a power-driven winch. With this arrangement, we have almost unlimited power and therefore pull-in longer pieces, sometimes over 1,000 feet in one length. Personally, I believe that we are literally pulling our lead covered cables to pieces. Both lead and copper are comparatively soft metals and, therefore, I do not believe they will satisfactorily withstand the terrific strains we are placing on them."

This certainly is a most interesting observation and we would be pleased to have the opinions of our readers on the subject.

* * *

A new superpower multi-reflex loudspeaker has been designed for use when required for extreme long range sound projection over wooded or built up areas, rough terrain or water. This speaker has been used extensively in the present war for psychological warfare applications, ship-to-ship convoy and combat communication.



New superpower loudspeaker.

This new design has a superpower audio capacity of 200 watts and is designed with 250-cycle low frequency cut off for crisp clarity in voice projection. The projection range of this speaker is more than 1½ miles.

The projector is reflexed for compactibility and mounts a battery of hermetically sealed, shock and blast-proof driver units. Rubber damped rim construction effectively eliminates all trace of mechanical or acoustic resonance and rattle, even at full power. This new speaker will be found suitable for installation in stadiums, racetracks, ball parks, shipyards, freight yards, airports, fire departments, etc.

Some telephone companies will, no doubt, make use of loudspeakers in large numbers after this war is won.

* * *

It is hoped that after the war someone will develop a small, lightweight, plug polishing machine. This tool should be motor driven and provided with shock mounts so it can be used on the key shelf of a manual switchboard.

* * *

It would seem desirable to keep containers of cable desiccant in switchboards to absorb the moisture in wet, humid climates. These units could be reactivated by heating, when necessary, and re-used.

* * *

It is believed that the recently perfected "Fiberglas" tape, backed with a heavy adhesive, will find various applications in the telephone field. This, or the new acetate film tape, should prove suitable for protecting drop wire from abrasion by trees.

WHERE SPEED COUNTS!!

The Model HD Earth Boring Machine digs holes 6 to 20" in diameter . . . 7' to 10' deep . . . in less than two minutes' time.

Digs in clay, hardpan, shale or frozen ground.

Sets pole 40 to 45' in length, 2,000 to 2,500 lbs. in weight.

Equipped with integral winch and derrick, the Model HD Earth Boring Machine does all of the work — no need for extra line truck and extra crew to set the poles.

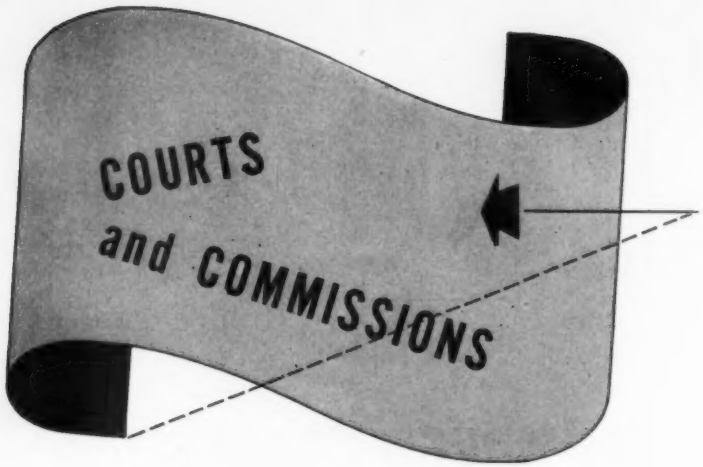
HIGHWAY TRAILER COMPANY

MANUFACTURERS OF

TRUCK TRAILERS AND BODIES · EARTH BORING MACHINES · WINCHES · OTHER PUBLIC UTILITY EQUIPMENT

GENERAL OFFICES

EDGERTON · WIS. · U. S. A.



Nebraska Advances Compensation Bills to Third Reading

The Nebraska Legislature has advanced to third reading, without opposition, a bill requiring the Nebraska Workmen's Compensation Court to hold a hearing on claims within 60 days, handing down a decision within 30 days thereafter. (TELEPHONY, January 20, page 37.)

The bill contains a provision that two of the three members of the court shall represent, respectively, the employer and labor, and that salaries of judges shall be increased from $3,000 to $3,600 a year.

Another bill similarly advanced brings within the unemployment compensation law all employers with a payroll amounting to $10,000 per quarter, increases maximum weekly benefits from $16 to $18 per week and increases the period for which payments shall be made from 16 to 18 weeks. (TELEPHONY, February 3, page 28.)

The legislature turned down an amendment that would have brought under the law all businesses employing four or more persons. The present law covers the employment of eight or more workers.

V V

Seek to Preserve Commission Jurisdiction Over Companies

The executive committee and the committees on legislation and cooperation of the National Association of Railroad & Utilities Commissioners met in Washington, D. C., on March 22 and the committee on legislation was directed to seek amendments to pending rural telephone legislation in Congress to preserve the jurisdiction of state commissions over rural telephone companies, it is understood.

The NARUC group also considered a request of Robert A. Nixon, director, Transportation & Utilities Division, Office of Price Administration, that a committee be appointed to advise with the OPA from time to time on matters of mutual interest, which, no doubt, would cover the matter of telephone rates. It is understood that the special war committee of the NARUC was directed to handle any requests for information or advice by the OPA.

V V

Rosel H. Hyde Appointed FCC General Counsel

Rosel H. Hyde recently was appointed general counsel of the Federal Communications Commission to succeed Charles R. Denny, Jr., who was sworn in as a member of the FCC on March 30. (TELEPHONY, March 24, page 20.)

The commission also announced that Vernon L. Wilkinson, former special assistant to the attorney general, has been appointed assistant general counsel in charge of broadcasting.

Leonard Marks, chief of the new facilities section in the broadcast division of the FCC law department, was named special assistant to the broadcast counsel.

ROSEL H. HYDE

V V

Nebraska Independent Submits Rate Increase to Patrons

The Union Telephone Co. of Blair, Neb., has submitted to patrons of its Bloomfield, Neb., exchange a schedule of increased rates for approval before submitting the application to the Nebraska State Railway Commission.

V. F. Bellows of the accounting department stated that the operating margin of the company is so small that if any more telephones were added, it would disappear entirely. The company now has 499 telephones. The proposed rate schedule is: Business, $3.50; individual residence, $2.00; two-party residence, $1.75; farm, $1.50, and switching charge, 60 cents.

Mr. Bellows said that the company plans to install common battery service, but will need the new rates at once, since it will require six months to make the change.

A. L. Dawson, who has divided his managerial duties with the Crofton, Neb., exchange, will be resident manager.

V V

Nebraska Independent Asks Rate Increases

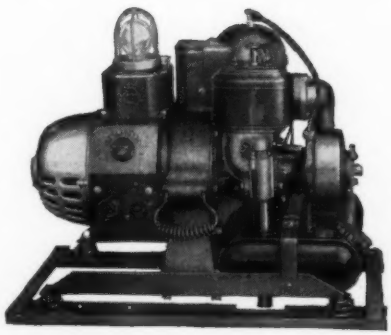
The Magnet (Neb.) Independent Telephone Co. recently asked the Nebraska State Railway Commission for authority to increase its rates which, at present, are: Business, $1.00 to $1.80 per month; residence and farm, $1.00 per month. Proposed gross rates are: Business, $2.25; residence and farm, $1.50.

The present owner, Frank L. Trumehlan, stated that the original large number of stockholders had been re-

LIGHT

BRIGHT
and
RIGHT

Only 100 pounds complete, a Homelite Gasoline-Engine-Driven Generator has the power to furnish plenty of electric power . . . 2000 watts . . . enough to operate the brilliant floodlighting you need for emergency night repairs. ✳



A Homelite Portable Generator is *right* from the standpoint of design and construction. Light, compact, rugged, easy to start, easy to operate, easy to keep in top condition, and extremely dependable at all times.

✳ **Just one of many uses for a Homelite. Send for our new booklet showing all the time-saving uses of Homelite Portable Generators, Pumps, and Blowers.**

HOMELITE CORPORATION
Portable **PUMPS • GENERATORS • BLOWERS**
PORT CHESTER, NEW YORK

duced to five or six, and that after the death of Reuben Sandberg, who purchased the company some years ago, the company was left in the hands of the operators. With the number of subscribers dwindling to 22, the property was so neglected that when sold for taxes, it brought $25.

Mr. Trumehlan plans to rebuild the plant and provide adequate service.

V V

Power Companies Immune to Suits on Inductive Interference

A bill recently passed by the North Dakota Legislature, effective July 1, gives a substantial immunity to power companies against suits by telephone companies for inductive interference.

The bill provides that in the absence of negligent construction or operation of power facilities, the operators of power lines shall not be required to bear any part of the cost of correcting inductive interference. The bill was sponsored by REA co-ops. It is understood that a similar bill was introduced in the South Dakota Legislature, but died in committee.

V V

Urges Burke Bill Defeat

Contending that .65 of 1 per cent utility excise tax, originally enacted in 1932 to meet a poor relief crisis, has long since served the emergency, and that utilities, generally, can ill afford continuance of the tax, J. J. Joseph of the Ohio Bell Telephone Co., Cleveland, urged the Senate Taxation Committee to defeat the Burke Bill and provide a measure of relief to the utilities. Hearings on the bill were continued to a later date.

V V

Asks Utilities Tax Increase

In his message to the opening session of the 1945 Florida Legislature April 3, Gov. Millard Caldwell suggested that the state tax on gross receipts of electric, gas, telephone and telegraph companies be increased from 1½ per cent to 10 per cent, to produce an additional $6,000,000 annually.

V V

REA Telephone Bill Proposed

A bill to authorize rural co-ops to render telephone service recently was introduced in the Pennsylvania Legislature. Similar legislation was proposed by the North Carolina Legislature. (TELEPHONY, March 24, page 30.)

V V

Requests Increased Rates

The San Jacinto (Ind.) Telephone Co. through its owner, Sylva Renner, has filed a petition for increased rates with the Indiana Public Service Commission. The petition, asking for a straight 30 per cent increase in the rates now in effect, was heard in Indianapolis on April 10, 1945. Eighty per cent of the present subscribers have agreed to the increase.

V V

Passes Obscenity Bill

The Maryland House of Delegates on March 24 passed a bill making it illegal to use obscene language in telephone conversations or to make use of a telephone in arranging immoral engagements. The bill said nothing about how the law could be enforced.

V V

Summary of Commission Rulings and Hearings

Federal Communications Commission

March 19: Granted request of American Telephone & Telegraph Co. for extension to 12 months of time previously prescribed for commencement of construction of facilities between Chicago, Ill., and Minneapolis, Minn.

March 19: Issued construction permit to American Telephone & Telegraph Co., Long Lines Department, Lawrenceville, N. J., for four additional transmitters for point-to-point telephone station.

March 19: Issued construction permit to Mutual Telephone Co., Manawahua, T. H., to replace two transmitters; one for point-to-point telephone station and one for point-to-point telegraph station.

March 20: Granted authority to American Telephone & Telegraph Co. and Southwestern Bell Telephone Co. to supplement existing facilities between Chicago, Ill., Houston, Tex., and other points at an estimated cost of $962,400. Construction will provide for 1945 requirements of 119 additional channels, totaling approximately 44,600 channel miles.

March 26: Granted 60-day authority to American Telephone & Telegraph Co., Long Lines Department, New York, N. Y., to operate temporarily, beginning at once, lines of Illinois Commercial Telephone Co. from Marion Clay County Line to Clay City, Ill., from Keens, Ill., to Fairfield, Ill., and from Carmi, Ill., to Grayville, Ill., in order to provide teletypewriter exchange service.

March 27: Granted authority to Southwestern Bell Telephone Co. and American Telephone & Telegraph Co. to supplement existing facilities between Houston and Beaumont, Tex., by constructing and operating two toll cables between these points. Estimated construction cost, $1,115,000.

March 27: Granted authority to American Telephone & Telegraph Co. and New York Telephone Co. to supplement existing facilities along cable routes between New York, Boston and other points by constructing and operating additional carrier systems and associated equipment. Estimated cost, $729,300.

Kansas State Corporation Commission

April 19: Hearing on application of Wayne (Kan.) Independent Telephone Co., Inc., for authority to make certain rate changes.

April 24: Hearing on application of Gorham (Kan.) Telephone Co. for authority to make certain rate changes.

May 8: Hearing on application of Farmers Telephone Association of Flush (Kan.) for authority to make certain rate changes.

Wisconsin Public Service Commission

April 10: Hearing on application of Quarry-Riverside Telephone Co., Cato, for authority to increase rates.

April 11: Hearing on application of Lavalle (Wis.) Telephone Co. for authority to increase rates.

V V

Wickliffe, Ky., Telephone Owner Drafted; Service Stops

Any hope for a quick renewal of telephone service at Wickliffe, Ky., was discouraged when Roscoe Patterson, 32, owner of the Wickliffe Telephone Co., passed a final physical examination and was sworn into the Navy on April 4. (TELEPHONY, April 7, page 33.)

Mr. Patterson said he would continue his efforts to sell the company for approximately $12,000. Prospective buyers will have to negotiate a purchase with him through correspondence or visit him at his post, he explained.

The Wickliffe exchange, which had been operated by Mr. and Mrs. Patterson and Virginia Jones for some time closed April 4.

Asserting the telephone company had been a " 'round the clock" job for him and had placed a severe strain on his wife, Owner Patterson said he was looking forward to a "vacation" in service, with "regular sleep, regular meals and regular work."

The sailor said his father acquired the Wickliffe telephone system more than 20 years ago when it boasted only about 40 telephones. He took charge of the company three years ago, he explained, when his father, now 73, retired. Mr. Patterson said he had tried without success to hire a lineman for 2½ years, and has been doing all the outside work himself.

Long distance service in Wickliffe is being maintained by Southern Bell Telephone & Telegraph Co.

V V

Receives Bronze Star Medal

MAJ. H. B. FLOWER, former plant superintendent of the Iowa Continental Telephone Co., Grinnell, and associated companies, has been awarded the Bronze Star Medal, it was reported recently. (TELEPHONY, February 24, page 38.)

GARY SERVICES AND INVESTMENT COMPANY

(A Wholly-Owned Subsidiary of Theodore Gary and Company)

The company with offices in Chicago, Illinois, Washington, D. C., and Wilmington, Delaware, renders engineering, technical and other assistance to companies in the Gary Group and is active in public relations as they affect the Independent Telephone Industry as a whole.

Mr. Howard A. Burroughs, manager of the Washington Office, services the wartime requirements of the Gary Group companies and will be glad on request to give friendly assistance and cooperation in Washington to friends and customers of the various companies in our Group.

GARY SERVICES AND INVESTMENT COMPANY

Head Office: 1100 King Street, Wilmington 33, Delaware

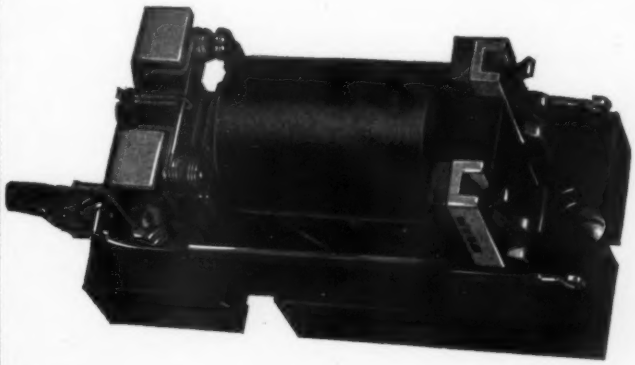
A. E. Carlson—Secretary

332 S. Michigan Avenue
Chicago 4, Illinois

Munsey Building
Washington 4, D. C.

FAHNESTOCK ELECTRIC COMPANY, INC.

Type 3-A Arrester Relay



SOLD BY

WESTERN RAILROAD SUPPLY COMPANY

2360 SOUTH ASHLAND AVENUE

CHICAGO 8, ILLINOIS

● For years there has been a definite need for the use of a protector of the type illustrated above. Its particular adaptation is on rural and toll lines where they parallel power lines for a considerable distance. Many REA lines are strung parallel with rural and toll lines throughout the country. Arrester Relay No. 3-A is the answer.

●

USITA COMMITTEE TO STUDY SMALL COMPANY FINANCING

A SUB-COMMITTEE of the United States Independent Telephone Association's Rural Telephone Service Committee has been formed to explore the needs and present methods of financing small telephone companies. Rupert E. Shotts, Columbus, Ohio, president, Associated Public Utilities Corp., has been named chairman of the sub-committee on finance. Other members of the committee include John Agee, vice president, Lincoln (Neb.) Telephone & Telegraph Co.; R. A. Phillips, Sioux Falls, S. D., vice president, Central Electric & Telephone Co., and John Wright, president, Jamestown (N. Y.) Telephone Co.

The first undertaking of the committee will be to make a survey of the amount and type of financing needed and required by operating units serving less than 1,000 stations. A survey is to be made to determine the amount of present loans to such units together with their additional requirements for postwar rehabilitation, plant improvement and extension.

The committee proposes to determine the availability of funds through both federal agencies and private banking institutions as well as other possible sources. Preliminary investigations show that federal funds are available through the Reconstruction Finance Corp. for individuals or companies organized for profit. It also appears that other federal agencies may make loans to mutuals and cooperatives not organized for profit.

Included in the scope of work proposed for the sub-committee is an additional program designed to acquaint local banks with the desirability of making loans to small telephone operating groups. The committee proposes to study the possibilities of standardizing on loan application and mortgage forms. It also will study the possibilities of working out some rule of thumb formulas for testing the adequacy of loan coverage and to provide margins for amortization.

The desirability of sponsoring local committees within state association groups also will be studied in order to have an on-the-ground approach to local financing problems.

Mr. Shotts recently conferred in Washington with representatives of the RFC. A questionnaire is being prepared for the use of state associations in determining the needs of small companies within their respective states.

RFC Broadens Loan Policy On Small Firms

The Reconstruction Finance Corp. on April 7 set in motion a twofold program which, it believes, will provide small business enterprises with all the postwar financial assistance they will need.

The agency outlined the plan as follows:

(1) The RFC will participate in bank loans to industry whenever a bank requests it. In effect, it will guarantee up to 75 per cent of the loan, and actually will put up 75 per cent of the money any time the bank calls for it. The RFC participation occurs automatically on request of the bank. The total amount of the loan must be no more than $250,000.

(2) If a business enterprise cannot obtain a bank loan, it may go to the RFC and, if considered deserving, will be granted a loan direct. Such loans will include money to be used as working capital.

RFC announced recently it would participate in loans made by credit pools regionally set up by groups of banks. This program now has been extended to include loans made by individual banks. The arrangement goes further than RFC has gone before in loan sharing, and its purpose is "to encourage maximum employment," the agency said.

The board of directors of RFC believes that the program makes unnecessary the various proposals for postwar action by other government agencies to help finance small business. RFC has one advantage: It does not have to seek permission of Congress.

The RFC believes most individual banks—especially the "country banks" which serve small enterprises — will welcome the program and use it. Here is the way it could work for an individual bank.

A business man asks for a $200,000 loan. The bank considers his prospect and decides it would be willing to risk $50,000, but no more. It may grant the loan of $200,000 and the RFC will assume the risk on $150,000 of that sum.

The bank may not charge more than 4 per cent interest on the $150,000 portion, nor more than 6 per cent on the $50,000. A participation charge must be paid by the bank to RFC. If RFC participation is more than 50 per cent of the loan, as in the foregoing case, the charge is .75 per cent. If participation is less than 50 per cent, the charge is 0.5 per cent.

At any time, the bank may ask RFC to furnish in cash its portion of the loan; that is, the $150,000. If this is done, RFC, instead of the bank, receives the interest on the $150,000.

V V

USITA Expands Rural Legislation Committee

The United States Independent Telephone Association has announced the reorganization and expansion of its Committee on Rural Telephone Legislation.

Oscar Burton, Tyler, Tex., has been appointed chairman of the committee with the following members: F. S. Barnes, Rock Hill, S. C.; H. V. Bozell, New York City; C. D. Brorein, Tampa, Fla.; W. B. Clay, Hutchinson, Minn.; Minor Corman, Atmore, Ala.; D. O. Hood, Portland, Ore., and Samuel Tucker, Pleasanton, Kan. This committee will analyze and deal with legislation pertaining to rural telephone service.

V V

Iowa Farm Line Rehabilitates Plant Without Aid

The fact that farmer-owned telephone systems can, themselves, rehabilitate their lines is shown by the Ireton (Iowa) Rural Telephone Association which has completely metallicized 12 of its 14 lines. The Ireton company operates five lines out of Hawarden, Iowa, and nine lines out of Ireton. This progressive work was reported at the association's 45th annual meeting which was held recently.

The association plans to metallicize the remaining two lines this year, putting the entire system in first class condition.

The financial report showed the association to be out of debt and that the metallicizing of its other two lines will not call for any additional financing.

V V

Announces Removal of Office

Hugh B. Bearden, former consultant to the Kentucky Public Service Commission, announces the removal of his offices to the Security Trust Building, Lexington, Ky., where he will serve as a public utility and industrial consultant.

THIS SPRING FWDs ARE DOING

More Work WITH *Less Manpower*

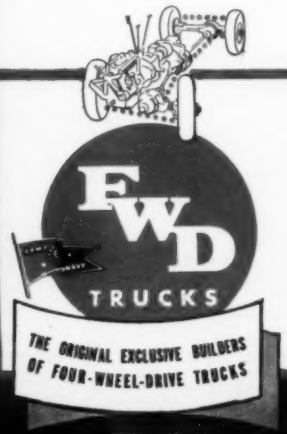
Embodied in this FWD Model SU is the accumulated experience of 35 years of four-wheel-drive leadership . . . a truck that has won extraordinary recognition and endorsement of motor truck users, in less than four years, to the extent of $75,000,000.00 in purchases.

The FWD Model SU Truck commands the attention of all who know quality. Superior power, ruggedness, speed and ability to perform without waste, are recognized FWD truck values that help overcome today's handicaps of manpower shortage.

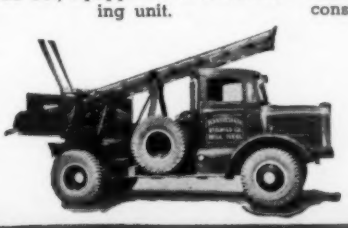
FWDs are multiplying available manpower by increasing the range and capacity of trained crews. FWDs go anywhere . . . get crews and equipment to any operation, off the highway or on it, in any weather, over even the tougest terrain, all year 'round, on trouble-shooting emergencies or routine jobs. Figure less depreciation, more years, more jobs done faster with FWDs . . . less upkeep and operating costs . . . less tire-wear . . . more work per gallon of gas, with balanced power delivered to all four wheels!

FOR ESSENTIAL INDUSTRIES, a limited number of FWDs will be available this year. Phone, wire or write us, or see the nearest authorized FWD dealer.

THE FOUR WHEEL DRIVE AUTO CO.
Clintonville, Wisconsin
Canadian Factory: KITCHENER, ONTARIO



Line construction and maintenance unit owned by Pennsylvania Railroad Co., equipped with earth-boring unit.



One of a fleet of FWD line trucks owned by New Jersey Bell Telephone Company — a unit that is without equal as efficient line construction and maintenance equipment.

by MAYME WORKMAN

traffic supervisor

the Illinois Telephone Association

and traffic editor

THE OPERATOR'S CORNER

"THAT'S THE company's rule," is a trite explanation, used many years ago (we hope), by employes in the telephone industry. Today, we are able to give a satisfactory explanation of the telephone company's policies and practices. Over a period of half a century or more we have learned many things about good telephone service.

An interesting pamphlet, entitled *This Thing Called Public Relations*, published by The Bell Telephone Co. of Pennsylvania, contains a fund of information on the subject of dealing with customers. One chapter, "We Know A Lot But—," ties in with this week's traffic question No. 2, "How would you handle a customer who objects to the company's rules?" Quoting from this chapter:

"Our girls know how to operate their boards. They know that they must be courteous, pleasant, agreeable — no matter what may come from the other end of the line. They know they must never lose their tempers. They know they must never give a curt answer. They've learned that good service is prompt, accurate, courteous service. The girls at our switchboards have had a large share in the reputation of our organization for giving good service.

"Our commercial folks who receive people at the business office, or who answer telephone calls, have learned that good service is service with a smile. They have learned that they always must have that 'willingness-to-serve' attitude which makes friends. They know they must answer questions fully, carefully, accurately, courteously. They have learned that 'a soft answer turneth away wrath.' They know that when a customer pays a bill, the recipient must be gracious in his attitude. These commercial folks who day in and day out meet customers in the routine handling of the job have contributed in no small degree to the favorable public attitude toward the service.

"To many folks the telephone company is the plant man—repairman or installer—whom they see driving about the highways. His courteous, careful, considerate driving has given him—and his company—a high reputation. The plant man, too, knows that good workmanship — workmanship with a smile—makes for a favorable attitude toward his company. We have heard people say they like to have the telephone man come around because he is courteous, pleasant. If a customer asks a question, he either has the answer or he offers to get it. When he has finished, he leaves no muss or dirt. The plant man gets close to the customer because he gets into the home. Somebody once said that the doctor has closer contacts with the family than does the minister. The plant man is the 'doctor' in the telephone business, and his contribution must be very large to what the customer thinks of the telephone service. So we can be assured that the telephone folks who go into the homes of customers know that what they do and how they do it and what they say are of no little importance in the scheme of things telephonic.

"Our accounting folks who carry all the burden of counting, sorting, listing the toll tickets, and who must go through the complicated billing procedures every month, have learned that they have a responsibility, too. That our bills are clear, clean, accurate and prompt is a contribution to good service.

"There can be no doubt that the regular, day-to-day routine normal handling of the telephone service job is in competent, well-trained hands. And that is largely where we get our reputation for giving good telephone service. It has carried us over many rough spots in recent years.

"'We Know a Lot But—,' that's the heading of this piece. 'But,' how do we perform when the irregular or the unusual thing turns up—the thing that isn't strictly routine? Or the thing that calls for finesse, for extra tact? Do we always do such a fine job when a customer comes to us with what he thinks is a legitimate complaint and who fails to see our side of the question? Do we always do such an outstanding job when we are trying to collect a bill from one of those habitual 'slow pay' customers, or when a property owner just can't see our problem when we're trying to get a permit for right-of-way, or when something that's hard to handle bobs up in the central office? Do we use the same methods when we are dealing with the barefoot boy, or the old lady with an accent, or the man with overalls as we do the lady in furs or the man in a cutaway coat? Are there some of us who get the attitude, when the going's rough, that we're pretty good—that we know just about all there is to know about the business—that the telephone business is our province and when we set up some rules those rules are just about right?

"Sure, we have to live up to certain rules and regulations. Sure, our practices and rates and all that sort of thing are pretty much under government supervision. Sure, we can't discriminate. We know all that. *But we can be thorough, clear, courteous in our explanations.*

"A newspaper editor once said that one of the best things about the telephone organization was the fact that we always explained every rule and practice. That's one on the credit side. If every person who came in contact with us—if every person who came to us with a request—if all were given full and complete explanations, tactfully and courteously, without any short answers, without any loss of temper, without any critical remarks — then there would be little opportunity for anyone to think anything but good of us and the service.

"We're doing such a swell job in every phase of the regular operations, we ought to make every effort to be sure we are not knocking some of the edges off that swell job by our handling of those other things which are an essential part of the business.

"Let's put a microscope on ourselves and if we see anything we don't like there, let's fix it. Then, the next time we must handle a tough case, we'll make a friend. Every contact should either make or keep a friend."

Questions from Illinois Operators

(1) When passing a call to the toll

center and the operator records the call as person-to-person, then charges are quoted and the subscriber refuses charges, who is responsible?

(2) How would you handle a customer who objects to the company's rules?

(3) How long can you hold the circuit on an MX precedence?

(4) When the first route is OD, can the circuit be held on the alternate route if an NC condition is encountered?

(5) Are the rules in Northwestern Bell offices any different from those of Illinois Bell offices?

The answers to these traffic questions are presented on page 37.

V V

North Carolina Independent To Install Dial System

Plans have just been announced by the Catawba (N. C.) Telephone Co. for the installation of a modern unattended dial telephone exchange system there.

L. P. Spoon, of Charlotte, N. C., owner of the system, said that a new switching house, new telephones, completely overhauled lines and three trunk circuits for long distance calls are included in the plans, as is a new circuit to serve the Sherills Ford and Terrell communities, with this line being entirely rebuilt.

Negotiations, he said, have been completed for long distance connections through the Newton, N. C., exchange of the Southern Bell Telephone & Telegraph Co.

Mr. Spoon said that completion schedules call for all lines to be ready for service by June 1 and a final conversion for long distance by July 5.

V V

Praise Independent Owner For Installing Dial System

The Rosalie (Neb.) *Rip-Saw*, newspaper, in a recent issue paid tribute to E. C. Hunt of Blair, Neb., owner of the Northeastern Telephone Co., who installed dial telephone service for residents of Rosalie and vicinity.

The commentary states, "To E. C. Hunt of Blair, owner of the telephone exchange, hats off to you for giving us what we have always wanted—a dial telephone system!"

V V

Sell Kansas Independent

Mr. and Mrs. George Swope who for the past five years have owned and operated the Penalosa (Kan.) Telephone Co. recently sold that company to Mr. and Mrs. Roy Henage.

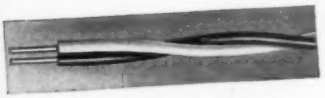
WHITNEY BLAKE

WB
WELL BUILT WIRES SINCE 1899

PLASTITE*
INSULATED WIRE

INSIDE, JUMPER, and DUCT

You will like this smooth, bright, extruded **PLASTITE** insulation, Because of these Features:—



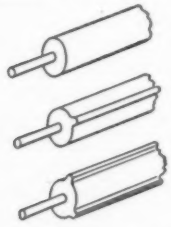
No. 22 Twisted Pair Inside, Brown or Ivory—22PN-2

No. 22 Triple Inside, Brown or Ivory— 22PN-3

No. 22 Twisted Pair Duct or Jumper, Black and Red— 22S-2

No. 22 Triple Duct or Jumper, Black, Red and Ivory— 22S-3

The above type can be furnished in 19 gage also.



THE RIDGE shown in the enlarged section is extruded on one leg of a twisted wire where both are the same color. This ridge makes tracing easy in darkness or in light. The third leg of a triple wire has two ridges.

* Reg. U. S. Pat. Office

1. Smaller Diameter, more wires in duct. Makes a neater job on inside wiring.
2. Colors are bright and permanent, easier to see.
3. Strips Cleanly and Easily.
4. Practically Ageless.
5. Trouble Proof Installations.
6. Flame Proof.
7. Low Cost.

A TRIAL ORDER will convince you that this is the ideal Duct, Jumper or Inside Wire.

Ask Graybar for { Prices / Samples / Bulletins }

Graybar Distributed by Graybar Electric Company

The WHITNEY BLAKE Company
New Haven, Connecticut, U. S. A.

IOWA SMALL COMPANIES DISCUSS RURAL SERVICE

THE DEEP interest held by small Independent telephone companies in Iowa in finding ways and means of solving some of their problems was exhibited on April 4 when representatives of a group of such companies braved a blizzard, accompanied by 14 to 15 ins. of snow, to attend the second meeting of the newly-formed Northeastern Iowa Telephone Group at Alta Vista, Iowa.

When the heavy snow and high wind hit the northern part of Iowa on April 3, the officers of the group were skeptical as to whether the meeting could be held. However, by 10:00 a. m. April 4, automobiles and trucks bearing small company owners, managers and directors began rolling into Alta Vista, permitting the meeting to begin one hour later. From 11:00 a.m. until 12:30 p.m., an open forum on plant construction was held and many valuable suggestions were made concerning the adoption of new methods and equipment in the construction of rural telephone plants.

The afternoon session was opened by President C. C. Pearce, Riceville, Iowa, who was instrumental in the formation of the Northeastern group.

W. H. Fowler, Pella, Iowa, manager of the Fowler Telephone Co., addressed the meeting and emphasized the need for smaller Independent companies to rehabilitate their plants so that they can give the best of service. He urged a concerted effort on the part of those companies to bring their rate schedules up to a limit that will permit the maintenance of their plants, the payment of adequate wages and salaries and a reasonable return on their investments.

Mr. Fowler also reviewed the activities and work of the Iowa Independent Telephone Association in helping the small companies and urged all present to become members of the association and take part in its affairs. He recommended also that state associations and the United States Independent Telephone Association consider placing more small company representatives on committees, particularly those that deal with legislation and other matters which directly affect the small units.

Russell Gray, Waterloo, Iowa, district manager for the Northwestern Bell Telephone Co., presented a comprehensive analysis of the so-called Hill Bill, pending in Congress, which would set up a rural telephone administration for the purpose of making loans to small telephone companies to be used to rehabilitate and expand rural telephone service.

Mr. Gray also reviewed the recent Federal Communications Commission report, entitled "Preliminary Studies on Some Aspects of the Availability of Landline Wire Communications Service." It will be recalled that in this report the FCC charged that the telephone industry has neglected the rural areas and quoted figures on the number of rural establishments served at various periods between 1920 and 1940, without giving consideration to the thousands of farms connected between 1940 and 1944. The FCC did not show that telephone service was available from existing facilities to the majority of farmers in the country, yet its report was on the availability of rural telephone service.

Mr. Gray stated that a questionnaire survey which his company had made in Iowa showed that telephone service over existing facilities was available to approximately 90 per cent of the farms in Iowa if they desired the service.

He also reviewed the answer of the American Telephone & Telegraph Co. to the FCC report and commended the reply made to the FCC by the United States Independent Telephone Association. (TELEPHONY, March 24, page 15.) Both the AT&T and USITA replies pointed out glaring errors and incomplete statements concerning rural service made in the FCC report.

R. C. Reno, editor of TELEPHONY, addressed the group concerning the need of increased rates on the part of many small telephone companies and he urged those present to take steps to effect adequate rate structures immediately.

He reviewed the factors bringing about the decline in rural telephone service and listed four: (1) Low and inadequate rates charged by small companies, making it impossible for proper maintenance and extension of plants and for adequate maintenance reserves; (2) hesitancy on the part of state regulatory commissions and city councils to advise with and encourage small companies to keep their businesses healthy, and the apparent interest of some of those bodies in holding or forcing rates down without proper regard to revenue requirements of telephone companies; (3) establishment of REA electric lines which have caused inductive interference on rural telephone lines and which, because of low revenues, many telephone companies have been unable to eliminate; (4) the advent of automobiles and radio which, no doubt, has diminished the value and need of rural telephone service.

Mr. Reno suggested that the industry was to blame for some of its rural problems. He stated that: (1) There has been too much reluctance in insisting that the public pay adequate rates for good telephone service; (2) we have failed to make sufficient effort to sell telephone service in competition with other commodities; (3) we have been too timid in going before state regulatory commissions and the public for adequate rates; (4) we have shown too much favoritism to the farmer in the past years by not insisting that he pay his proportionate share of the cost of rendering good telephone service.

Mr. Reno's address will be published in a future issue of TELEPHONY.

During the meeting there was considerable discussion concerning the need of rural telephone legislation and judging by the comments made by the small company owners and managers present, they were of the opinion that such legislation is unnecessary and that the industry can take care of its own rural problems if it is given an opportunity to do so after the war ends.

The next meeting of the group will be held in Jesup some time during the summer. H. J. Hopkins is manager of the Farmers Mutual Telephone Co. at Jesup and has been active in the organization of the Northeastern Iowa Telephone Group.

V V

Secretaries of Roadway Companies Confer

Without waiting for governmental aid to roadway and telephone co-operatives, some Michigan telephone companies are reported to be calling together groups of roadway company secretaries for discussions, demonstrations and construction and maintenance information, according to a bulletin of the Michigan Independent Telephone Association.

One company has built a rural demonstration unit to show how poor transmission is caused by bad wire connections and how inductive interference can be eliminated by transpositions.

Of use in educating roadway secretaries and maintenance men are two pamphlets, *How to Build and Repair a Farm Telephone Line* and *Rural Telephone Trouble* which may be purchased through TELEPHONY at 25 cents a copy.

Indiana Company Modernizes Summitville Plant

The Union Telephone Co. has modernized its plant at Summitville, Ind. The company recently purchased a ground floor location for its commercial office and operating room. The new quarters were remodeled and an attractive and comfortable office created.

A new cable installation was used to tie the outside plant with the new central office equipment. The new switchboard and protection equipment were cut into service on February 20.

The Summitville exchange is owned by John T. Detchon. The installation and cutover were under the direction of H. W. Hill, plant superintendent from the company's headquarters at Greenfield, and Ralph Burns, plant man at Summitville. E. C. Mull, secretary-treasurer, and F. W. Young, vice president; represented the company at the cut-over.

V V

Install 700 Miles of Telephone Lines on Iwo Jima Island

Fighting snipers and pillboxes, Signal Corps men of the Fifth Marine Division laid more than 700 miles of telephone wires in their first five days ashore on Iwo Jima Island. Nearly 40 telephone exchanges and more than 200 sub-exchanges were tied in with two central switchboards.

The men were aided by Tim, a black Betuan Shepherd dog, who, carrying a reel of light telephone wire on a small harness, helped lay the lines.

Answers to Traffic Questions on Page 34

(1) If the tributary passed the call as a person-to-person call, the toll center operator would be responsible for the error.

(2) Please refer to the preface for the answer.

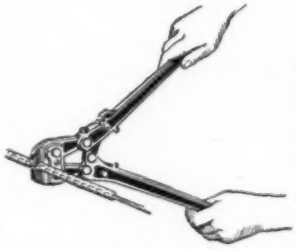
(3) If a report is not received from the distant office within 15 minutes from the time you requested MX precedence, reach the distant operator and say, "AG," and wait for a report.

(4) Yes. In this case the alternate route becomes the first route.

(5) Generally speaking, they are the same. Occasional differences in practices may exist between the various Bell operating companies, probably due to conditions existing in the territories in which they operate.

TOOLS
TO SPEED LINE WORK

Shown below are some of the tools Graybar can supply to help you save time on line maintenance or essential construction jobs. For complete information about these and other linemen's tools, call the Graybar Telephone Specialist near you. *Graybar Electric Company, Graybar Building, New York 17, N. Y.*



FOR FASTER, SURER SPLICING — Nicopress sleeves and No. 51 splicing tool save time, reduce expense, and produce strong, tight, moisture-proof joints. One man can splice the wire — on the ground or on the poles. Each splice develops the full rated strength of the conductor.

PLIERS FOR ALL PURPOSES — Linemen favor Klein's pliers because of their firm grip, handy shape, powerful leverage, and keen cutting knives. GRAYBAR offers all types: long-nose, chain-nose, curved-nose, duck-bill, sleeve, cord-tip-closing, side-cutting, oblique-cutting, and end-cutting.

CLIMBERS THAT COMBINE COMFORT WITH SAFETY — Klein's No. 1939 linemen's climbers weigh only 2½ pounds per pair — less than ordinary styles. Yet they are amply strong, and every one has been tested. GRAYBAR also supplies Klein's climber straps, ankle straps, climber pads, and gaff guards.

SUPERSTRONG SAFETY STRAPS — "Klein-Kord" safety straps provide utmost protection. Each of six plies of specially woven, long-staple cotton yarn is laid in rubber and vulcanized. Snaps and buckles are galvanized, drop-forged steel, individually tested to withstand a 1500-pound pull.

via GraybaR
First Source of Telephone Supplies

4525

IN OVER 80 PRINCIPAL CITIES

Directors of Texas Association Hold One-Day Meeting

Inasmuch as the annual meeting of the Texas Telephone Association was canceled, the directors, including those newly-elected by mail ballot, held a one-day meeting at the Baker Hotel in Dallas on March 27.

The following directors were present: Fabian Bearden, Baird; Oscar Burton, Tyler; George M. Johnson, Santa Anna; R. S. Martin, Houston; W. L. Prehn, Dallas; A. L. Robb, Electra; John Y. Rust, San Angelo; H. T. Shipmen, Pecan Gap; Jean Shotwell, Lufkin; Sam H. Shutt, Sherman; Ralph Sparks, Pecos; D. T. Strickland, Brownwood; J. E. Stewart, Texarkana; W. P. Donalson, Dallas, and Fred C. Trower, Corsicana. Absent directors were: D. H. Comparette, Jr., Kerrville; R. B. Fairly, Lubbock; Leonard Mallory, Hubbard City; L. Rust, Del Rio; T. A. Singer, Dimmitt, and S. W. Teas, Floresville.

The directors elected the following officers: President, Mr. Burton; Mr. Shutt, first vice president; Mr. Fairly, second vice president; Mr. Shotwell, treasurer, and Gertrude Tucker, Austin, acting secretary.

An executive committee consisting of Mr. Burton, ex-officio member; Mr. Shutt, Mr. Fairly, Mr. Prehn and Mr. Strickland was appointed.

Texas State War Council
Certificate of Commendation
To The Telephone Companies
Serving the State of Texas
For outstanding meritorious services in Civilian Protection of the
State of Texas during the Second World War

The schedule of topics discussed by the board included the necessity of rate increases on the part of many small companies; the state's gross receipts tax law and its interpretation, as well as a number of subjects affecting the operation of Texas companies.

The main order of business was discussion on the rural telephone legislation now pending in Congress. After a full discussion of this subject, the following motion was adopted: "We concur in the conclusions reached at the meeting of the board of directors of the United States Independent Telephone Association on March 15 in Chicago, Ill., and pledge full cooperation to the said committee in attaining its objectives." (TELEPHONY, March 24, page 13.)

ADOPT

SUB-CYCLE The Master Ringing Converter

Easily Installed
Low in Price
Low in Upkeep
Quiet in Operation
No Moving Parts

Sub-Cycle assures powerful, trouble-free ringing service. Designed in accordance with modern engineering principles — Fully field-tested to prove its dependability. Made in six models to carry loads ranging from small PBX to large Central Offices. Sub-Cycle fully meets the requirements of all who use it.

ALSO PULSATORS

SOLD BY LEADING DISTRIBUTORS

LORAIN PRODUCTS CORPORATION
LORAIN, OHIO

FUNDAMENTALS OF TELEPHONY

By ARTHUR LEMUEL ALBERT

Professor of Communication Engineering, Oregon State College

374 pages, 5½ x 8½, 200 illustrations, $3.25

This book tells how and why telephone apparatus and lines operate as they do, covers the electrical theory and circuits with which every telephone worker should be familiar. It explains the phenomena of sound as they apply to telephony. It gives a practical knowledge of the functioning of transmitters, receivers, and other elements of telephone sets and systems, including modern manual and dial systems. It shows the requirements of local and toll transmission lines and how they are met, covering electrical measuring instruments, the measurements used in telephony, the problems of interference in telephone circuits, and other topics, in a clear, well-illustrated, elementary treatment, especially arranged for the non-engineering reader.

Check the data in these chapters

1. Direct-current Theory
2. Alternating-current Theory
3. Electric Networks
4. Sound, Speech, and Hearing
5. Telephone Transmitters
6. Telephone Receivers
7. Telephone Sets
8. Manual Telephone Systems
9. Dial Telephone Systems
10. Transmission over Circuits with Distributed Constants
11. Transmission over Circuits with Lumped Constants
12. Measurements in Telephony
13. Inductive Interference
14. Telephone Repeaters and Carrier Systems

Order a Copy from

TELEPHONY PUBLISHING CORP.
608 S. Dearborn St. Chicago 5, Ill.

At the directors' luncheon, Col. Homer Garrison, chairman of police mobilization, Austin, Tex., presented a Certificate of Commendation to the telephone industry of Texas on behalf of Gov. Coke R. Stevenson for outstanding meritorious service in civilian protection of the state when the Air Raid Warning Signal System was set up. Miss Tucker, the association's acting secretary, accepted the award from Colonel Garrison and made the acceptance speech.

V V

Canadian Company Increases Telephone Installations

Now serving a population of some 90,000 and with assets valued at well over $1,000,000, the Island Telephone Co. operating in Canada's smallest province, Prince Edward Island, has increased telephone installations by about 30 per cent since the Dominion entered the war in September, 1939.

Atlantic Utilities, a wholly-owned subsidiary of Maritime Telegraph & Telephone Co. in Nova Scotia through which Prince Edward Island telephone service is provided by the Island company, reports that this expansion, relatively recent and not directly associated with war work activities, is likely to be retained permanently.

V V

New England T&T Stops Return Envelope Inclosures

The New England Telephone & Telegraph Co. recently discontinued inclosing return envelopes with bills to residents of metropolitan Boston, Springfield and Worcester, Mass., as well as Providence, R. I., when it sent out the March statements to subscribers.

A recent investigation showed that 85 per cent of telephone subscribers do not use such envelopes in paying telephone bills. For the same reason, this practice was discontinued in other sections of the company's territory over two years ago.

V V

Former Comptroller Now Heads Manitoba Telephone System

Peter Millar, comptroller of the Manitoba Telephone System, Winnipeg, Man., since 1940 and on loan in recent years to the Canadian Government as general manager of Defense Communications Ltd., succeeds John E. Lowry, retired, as commissioner of the system, it was announced by the Hon. William Morton, minister of telephones in Manitoba at Winnipeg.

A 36-year veteran of the service since going to Canada from his native Glasgow, Scotland, in 1909, Mr. Millar is former auditor of the system. His war job, now being wound up, placed him in charge of long distance communications from Ottawa east to the Atlantic Seaboard.

V V

Bell Laboratory Aids Army In Europe Renew Service

One thousand special vacuum tubes needed to replace those destroyed in telephone centers by German soldiers before they retreated from cities on the Western Front were supplied in 17 days by an American laboratory, it was revealed recently.

Axis telephone men pulled out all the telephone line vacuum tubes in the central stations, rendering the circuits useless. The Allies had nothing that would operate satisfactorily. A hurry call was sent to America by airplane, together with one of the tubes overlooked by the Germans.

In the Bell Telephone Laboratories, New York City, it was found that the needed bulbs could be made of spare parts of other tubes, with alterations.

Dr. Vannevar Bush, director of the Office of Scientific Research & Development, told the laboratory workers that "Your part in the spectacular job represents a record-breaking performance."

V V

Elect Telephone Officials Controller Members

George L. Harding, assistant comptroller, and S. W. Campbell, vice president and comptroller of the Pacific Telephone & Telegraph Co., both of San Francisco, Calif., and Charles S. Mason, auditor and assistant secretary of the Pacific company in Seattle, Wash., recently were elected members of the Controllers Institute of America, New York, N. Y.

The institute is a technical and professional organization of controllers devoted to improvement of controllership procedure.

V V

Marines Eliminate Five Japs Who Tried to Cut Telephone Lines

When five Japs tried to cut the communication lines of a battalion command post of the 24th Regiment, veteran Fourth Marine Division on Iwo Jima Island, they reckoned without their host, Marine Corp. Franklin C. Robbins, Connellville, Pa.

Waking to see a Jap leaning over his foxhole with bayonet in hand, Corporal Robbins grabbed his revolver and shot him. In the action that followed, Corporal Robbins, Pfc. Edward R. Ruby, Lisbon Falls, Me., and their buddies finished off the enemy patrol.

"YANKEE"

TOOLS

also make friends

Vast throngs of new shop workers, trained in war industries, have been using "Yankee" Fine Mechanics Tools for the first time . . . mastering fresh trade skills which will stand them in good stead in the peace years to come. They have learned what skilled mechanics and old-time factory men have long known . . . that "Yankee" Tools complete innumerable tasks *faster*, *easier*, and *better*. For half a century, the ingenuity of "Yankee" Tools has set a high record in speed and accuracy. The war has served to underscore that record.

Order from your industrial supply distributor, or write North Bros. Mfg. Co., Dept. T-445, Phila., Pa.

"YANKEE" SPIRAL SCREW DRIVER No. 130A
A Size for Every Purpose

"YANKEE" TOOLS
make good mechanics better
North Bros. Mfg. Co., Phila. 33, U. S. A.
Established 1880

Makers, also, of "Yankee-Handyman" Tools

L-M Pole Line Hardware...Designed for the Job

▼ Each L-M hardware item was individually designed to meet a need. Its size, shape, and materials were selected to meet the requirements of the *job*.

For over 30 years, Line Material has been designing, building, testing, and improving its pole line hardware on the basis of the needs of the user. That's why L-M hardware usually gets a high rating on dependability, durability, and suitability for the job.

LINE MATERIAL COMPANY
MILWAUKEE 1, WISCONSIN
Represented by
Automatic Electric Sales Corporation

HE SWORE HE WOULDN'T SHAVE TILL HE FOUND A ROLL OF GOLD SEAL TAPE THAT PEELED!

Small chance of ever finding a roll of Gold Seal Tape that peels . . . dries out . . . smears . . . or ravels. Jenkins lab-tests everything . . . base cloth, compound . . . controls production every step of the way. What is more, Jenkins cellophane-wraps – then boxes – every roll to make doubly sure Gold Seal reaches you factory-fresh! Jenkins Bros., Rubber Division, 80 White Street, New York 13, N. Y.

Jenkins Bros. also makes Diamond Seal Friction and Rubber Tapes which meet ASTM and Federal specifications.

JENKINS Gold Seal Tapes
FRICTION • • RUBBER

The ABC of the Telephone

(Concluded from page 17)

tery in series with the galvanometer, the potential drop across unit "A" is balanced. This fact is proved by the zero position of the galvanometer needle in *Fig. 13*. Winding N3 is associated with the receiver as is the small battery with resistance "A."

From this description it will be noted a sidetone balancing voltage is created in N3 during the transmitting interval. This same winding, during receiving, merely balances the voltage drop across the receiver. In no way does it oppose the change in the receiver's magnetic field caused by the current in No. 2. The voltage induced in N3 is stronger when sending than that created while receiving. Additional information on this detail is found in a comparison of the stepdown characteristics of the induction coil windings during the two functions. *Sending* — current in N3 results from current, primarily, in N2. The step down ratio, N2 into N3, is, roughly, 5.5 to 3. *Receiving*— current in N3 results from current in N1. In this instance the step-down ratio from N1 into N3 is about 7.7 to 3. Therefore, the voltage in N3 is an effective factor in one case, whereas it can be disregarded practically in the other.

SUMMARY: The only differences found in these three circuits is in their theory and the ratio of turns in the induction coil windings. Under actual circuit conditions it is possible to obtain transmitting and receiving efficiencies for the anti-sidetone circuit which are practically equal to those of the sidetone or booster circuit. In addition, the reduction in sidetone amounts to about 10 decibels (db) as compared with the sidetone circuit. A decibel is a unit of sound intensity measurement. A 10 db reduction lowers sidetone to a point where it does not interfere with either transmission or reception.

V V

Need Telephone and Radio Men

A call for men to operate radio and telephone systems for the Texas State Guard, 28th Battalion, was issued at Corpus Christi, Tex., March 24 by Lieut. Nelson Oliver, headquarters detachment commander, who pointed out that this work offers valuable pre-induction training.

ROEBLING

NOTE-WORTHY...

For Superior Wire Value

Make a note of what you get—with these 5 stand-out Roebling telephone wires and cables: Dependability on difficult assignments . . . service that lasts . . . elimination of frequent replacements . . . saving of expensive, trouble-shooting man-hours . . . reduced maintenance costs.

It all adds up to superior wire value—to help you keep busy phone circuits trouble-free today . . . and profitable tomorrow!

With the skill acquired in a century's wire specialization, Roebling performs every operation in its modern mills—from hot-rolling copper bars to testing finished cable — to assure you the finest in wire products.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities

ROEBLING

PACEMAKER IN WIRE PRODUCTS

WIRE ROPE AND STRAND • FITTINGS • SLINGS COLD ROLLED STRIP • HIGH AND LOW CARBON ACID AND BASIC OPEN HEARTH STEELS • ROUND AND SHAPED WIRE • SUSPENSION BRIDGES AND CABLES • WIRE CLOTH AND NETTING • ELECTRICAL WIRES AND CABLES • AERIAL WIRE ROPE SYSTEMS AIRCORD, SWAGED TERMINALS AND ASSEMBLIES

Crapo GALVANIZED PRODUCTS

ALL the strength and durability inherent in steel are combined---with definite economies---in Crapo Galvanized Steel Strand. Heavy, ductile, tightly-bonded zinc coatings, applied by the famous Crapo Galvanizing Process, provide lasting protection against corrosion.

Ask the distributor of Crapo Galvanized Products near you or write direct for further information!

INDIANA STEEL & WIRE CO.
MUNCIE, INDIANA

FOR LACING CABLES

and all other purposes requiring a superior waxed twine.

THE BARBOUR PRODUCTS
Division of
THE LINEN THREAD CO., INC.
60 East 42nd St., New York 17
Boston (10) Chicago (10) San Francisco (5)
Gloucester Philadelphia (6) Baltimore (3)

Schliekert Heads New Advertising Agency

Charles Schlieckert, former advertising manager for Cook Electric Co., has been named president of a newly formed advertising agency, to be known as Technographics, Inc. The new agency opened its offices April 2 at 1457 Diversey Parkway, Chicago. The agency specializes in industrial advertising and the marketing of new and improved industrial products.

CHARLES SCHLIECKERT

In addition to Mr. Schlieckert, who is president and part owner of Technographics, Inc., executive personnel of the new agency includes Roland Fulton, vice president; Carl E. Lundeen, secretary and treasurer; Sidney Borden, art director, and Florence Wolfe, space buyer.

Mr. Schlieckert, who for the past two years was advertising manager and director of priorities of the Cook company, for four years previously headed a small Chicago agency of his own known as Schlieckert & Teuber. For two years, he was advertising manager for Filmack Trailer Co. He began his advertising career with Batten, Barton, Durstine & Osborn, Inc.

V V

Announces Publication of Book On Microwaves

The McGraw-Hill Book Co., Inc., recently announced the publication of the first edition of a book, entitled *Introduction to Microwaves*, by Simon Ramo, Ph.D., Research Laboratory, General Electric Co.; Union College, Schenectady, N. Y.

The book is described as a completely non-mathematical description of the physical basis for all microwave phenomena for engineers and industrial men who desire an understanding of microwaves and their application. It covers transit-time electronics, velocity modulation, radiation, transmission lines, resonant cavities and wave-guides and correlates microwaves with lower frequency electricity in simple language, with a large number of diagrams.

This 133-page book of instruction can be ordered through TELEPHONY for $1.75.

V V

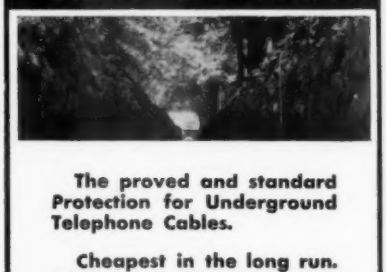
Theron L. Bowser, Made Staff Engineer of Stromberg-Carlson

Theron L. Bowser has been appointed telephone staff engineer of the Stromberg-Carlson Co., Rochester, N. Y., effective March 12, according to an announcement made by Frederick C. Young, vice president in charge of engineering and research. In his new position, Mr. Bowser reports directly to Dr. H. R. Reed, chief telephone engineer.

Mr. Bowser's duties are to provide up to date information on trends within the telephone industry and to study new types of equipment which might become part of the company's standard telephone line. Other duties include the study of types of factory installations and the supervision of the preparation of sales information for each type. Mr. Bowser also is to help set up performance characteristics to be used as criteria in telephone design.

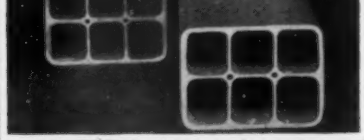
Mr. Bowser's education and varied work experience have given him a wide

SINCE 1889
NATCO
CLAY CONDUIT



The proved and standard Protection for Underground Telephone Cables.

Cheapest in the long run. Highest quality and a full line of shapes.



National Fireproofing Corp.
207 E. Ohio Street, N. S.
PITTSBURGH, PA.

background for the new staff position, according to Mr. Young. A graduate of Massachusetts Institute of Technology with a master's degree, Mr. Bowser was one of eight students chosen in 1926 for the first Bell System MIT experimental venture in cooperative education and telephone engineering. The five-year curriculum involved field study and work at Western Electric, New York Telephone Co. and Bell Laboratories. From 1929 to 1937, Mr. Bowser worked in the engineering

THERON L. BOWSER

department of the New York Telephone Co. He was associated with the Public Service Corp. of New Jersey from 1937 until 1939, and from 1939 until 1941, he worked with the Leich Electric Co.

Mr. Bowser joined the Stromberg-Carlson Co. in 1941, employed first in the research department. He was appointed assistant engineer in charge of the telephone development laboratory, a position which he held until his new appointment.

V V

Get Joint Radio Service

Quebec Telephone & Power Corp., providing telephone service for a population of over 350,000 in southeastern Quebec Province, and connecting with the Bell Telephone Co. of Canada and the New Brunswick Telephone Co., now has a radio service operating jointly with the Canadian Marconi Co., to afford direct oral communication between the north and south shores of the St. Lawrence River at its gulf.

V V

Operator Shortage in London

In London, England, officials estimate an immediate shortage of 1,000 trained telephone operators. The remainder of Great Britain urgently requires the services of an additional 3,000 switchboard attendants. The condition is described as the biggest telephone labor crisis of the war.

Six Marine Signalmen Destroy Jap Patrol

Adding to a growing list of tales of heroism of Marine Corps Signalmen at Iwo Jima Island is the one about a handful of Marines who, delegated to keep communications open, wiped out a 29-man Japanese patrol without a single casualty, and then got busy repairing regimental wires cut by enemy action.

The battle, according to Second Lieut. Jim G. Lucas, Marine Corps public relations officer, began shortly after 2:00 a.m. when flares revealed eight Japs less than 50 yards away, and continued until after dawn when the last of the enemy was destroyed or had committed hari-kari. Six marines took part in the action.

V V

Elect Aitken to Addressograph-Multigraph Board of Directors

The election of William I. Aitken, Lincoln, Neb., to the board of directors of Addressograph - Multigraph Corp., Cleveland, Ohio, manufacturers of business simplifying equipment, was announced March 29.

WILLIAM I. AITKEN

Mr. Aitken is a member of the law firm of Woods, Aitken & Aitken which, since 1927, has been general counsel of Addressograph-Multigraph and its subsidiaries in Canada, England, continental Europe and South America.

He also is a director of the Lincoln (Neb.) Telephone & Telegraph Co. and the Woodmen Central Life Insurance Co.

V V

Buys Telephone System

Perry Vance recently purchased the Farmers Telephone Co., Mirabile, Mo., from Cap Zeikle, the former owner and manager who died recently.

USE

BERNARD

LINEMEN'S PLIERS

FOR

POWER

to Cut, to Twist, to Hold!

BERNARD TOOLS GIVE

More Power to You!

Send for catalog of the Schollhorn line of BERNARD tools.

THE WM. SCHOLLHORN CO.

TELEPHONE TOOL DIVISION

420 Chapel St. New Haven, Conn.

Exclusive Makers of BERNARD Parallel Action Tools

Navy Industrial Organizers Association Navy Guests

A group of industrialists who were among the organizers of the Navy Industrial Association recently returned from maneuvers aboard the USS Pittsburgh as guests of the Secretary of the Navy, the Commander-in-Chief, U. S. Fleet, and the Chief of Naval Operations.

Industrialists who organized the Navy Industrial Association accompanied USS Pittsburgh on initial cruise enroute to active duty. Left to right: SIDNEY J. CLARK, assistant manager, Otis Elevator Co.; DWIGHT R. G. PALMER, president, General Cable Co.; C. C. FELTON, vice president, Revere Copper & Brass, Inc.; CAPT. E. GINGRICH; LIEUT. CMDR. EUGENE CASEY; ADDISON F. VARS, president, Sterling Engine Co.; M. H. EISENHART, president, Bausch & Lomb Optical Co.; MARK L. SPERRY, vice president, Scoville Manufacturing Co.

The six men comprising the group, all members of the board of trustees of the Naval Industrial Association were: C. C. Felton, vice chairman of the association and vice president, Revere Copper & Brass Co.; Addison F. Vars, vice chairman of the association's executive committee and president, Sterling Engine Co.; M. H. Eisenhart, vice president of the association and president of the Bausch & Lomb Optical Co.; Sidney J. Clark, association treasurer and assistant manager, Otis Elevator Co.; Dwight R. G. Palmer, director of the association and president of General Cable Co.; Mark L. Sperry, association director and vice president, Scoville Manufacturing Co.

In commenting on the trip Mr. Vars paid tribute to Capt. E. Gingrich, commanding, his officers and men. "To have been civilian shipmates with such a grand crew of fighting men," he said, "was not only a stimulating and signal honor to every one of us, but one long to be remembered. We learned to love the ship and our Navy more dearly than ever, as day by day, we participated in its maneuvers. Nothing was withheld from us by the heads of the different departments, such as gunnery and engineering, right through the ship, including navigation and communications."

"Our best thoughts and good wishes," continued Mr. Vars, "travel with every man aboard as the USS Pittsburgh goes forward on its history making career to parts where important engagements now are taking place."

Much of the success of the trip was due to the careful planning of the daily routine by Public Relations Officer Lieut. Cmdr. Eugene Casey who saw to it that practically every piece of equipment, from stem to stern, was demonstrated and explained, Mr. Vars said.

The idea of the Navy Industrial Association was implanted in the minds of industrialists when they attended the first two orientation courses conducted by the Navy at Columbia University. Now the membership is numbered in the hundreds, representing the top segment of American industry, all pledged to closest possible teamwork in war production with and for the Navy.

dependable
Gedar Poles
MICHIGAN POLE & TIE CO.
NEWBERRY—GRAND RAPIDS
MICHIGAN

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

C. M. Christiansen Co., Phelps, Wis.—Northern White Cedar Poles, plain or butt treated. Quotations on request.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants: Beaumont and Texarkana, Texas.

T. M. Partridge Lumber Co., Minneapolis, Minn.—Northern White—Western Red Cedar Poles. Plain or butt-treated.

Pensacola Creosoting Company, Pensacola, Fla.—Creosoted Southern Pine. Poles of Superior Long Leaf Quality.

ATLANTIC
Creosoting Co., Inc., 17 Battery Pl., N. Y. C.
Creosoted Pine Poles
Crossarms . . Conduit
PLANTS AND OFFICES:
New Orleans, La. Jackson, Tenn. Boston, Mass.
Winnfield, La. Louisville, Miss. New York, N. Y.
Norfolk, Va. Savannah, Ga. Philadelphia, Pa.
Annapolis, Md. Chicago, Ill.

Cedar Poles
MAC GILLIS & GIBBS COMPANY
Wells Bldg., Milwaukee 2, Wis.
Northern White and Western Red
Cedar Poles—Plain or Butt-Treated

Frank F. Fowle & Co.
Electrical and Mechanical
ENGINEERS
35 East Wacker Drive CHICAGO

ACCOUNTING
HERDRICH, BOGGS and CO.
Certified Public Accountants
803 Electric Building
INDIANAPOLIS 4, IND.

SLOAN & COOK
CONSULTING ENGINEERS
120 SOUTH LA SALLE STREET
CHICAGO
Appraisals—Original Cost Studies
Depreciation, Financial, and Other
Investigations

MANFRED K. TOEPPEN
Engineer
Consultation • Investigation
Reports
261 Broadway, New York 7, N. Y.

INSPECTION SERVICE
For poles, crossarms, and other timber products. Preservative treatments of timber products. Analyses of wood preservatives.
A. W. WILLIAMS INSPECTION COMPANY
Main office and laboratories: Mobile, Ala.
Branch offices: New York and St. Louis.
Inspectors conveniently located for prompt service.

J. G. WRAY & CO.
TELEPHONE ENGINEERS
Specialists in Appraisals, Rate Surveys, Financial Investigations, Organization, and Operation of Telephone Companies
3324 Bankers Bldg., Chicago

Classified Section

Rates 10 cents per word payable in advance. Minimum charge $2.00 for 20 words or less.

HELP WANTED

WANTED: Two combination men to take care of magneto exchanges, 556 stations and 833 stations in northern Illinois. Opportunity for permanent employment and good wages. Give age, experience, draft status and availability. Write Box 2155, c/o TELEPHONY.

WANTED AT ONCE: Lineman for magneto exchanges. Give age, experience and reference in first letter. Permanent position for right man. Write Doniphan Telephone Co., Doniphan, Mo.

WANTED: Telephone Accountant—qualified to supervise all phases of telephone accounting for Class A companies. Give full information as to age, experience, draft status, etc. Attach small photograph. Write Telephone Services, Inc., 16th Floor, Lincoln Tower, Fort Wayne, Indiana.

WANTED: Combination Plant Man to take care of Automatic Electric Dial exchange of 625 stations. Opportunity for permanent employment and good wages. Give age, experience, draft status and availability. Write Oklahoma Telephone Co., Broken Arrow, Okla.

WANTED: Lineman for telephone company operating approximately 2,500 stations in eastern Pennsylvania. Give full information as to age, experience, draft status, etc. Statement of availability necessary. Write Box 2152, c/o TELEPHONY.

HELP WANTED

WANTED: Owner of small telephone exchange and electrical contractor has opening for man wishing to enter telephone and electrical work. Would consider experience in one or both fields. Located in Minnesota. Write Box No. 2154, c/o TELEPHONY.

WANTED: A plant superintendent who has the knowledge and ability to engineer plant additions and to supervise the maintenance force of a locally-owned Independent telephone company having one large exchange of 4,000 stations. The position is permanent and carries a good salary. Furnish full details of your experience. Write Box 2153, c/o TELEPHONY.

CABLE CONTRACTOR

I do telephone and electric cable splicing and repairs on contract. Write T. W. Turner, 138 Second Ave., S., Brookings, S. D.

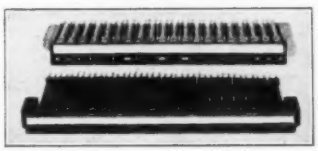
FOR SALE

WIRE GRIPS: Havens grips, $1.50 each. Number 1 Chicago, Buffalo wire grips, $1.00 each. No priority required. Immediate delivery. Write Wm. M. Miller & Son, 2553 Madison St., Chicago 12, Ill.

RECONDITIONED

MECHANICAL SIGNALS

NO RATING REQUIRED



A. E. CO.
D-281075
10 OR 20 PER STRIP
MOUNTINGS

KELLOGG
CODE No. 12 ON
No. 200 OR No. 465
MOUNTINGS

W. E. CO.
No. 42 ON No. 77-79 OR 105 MTGS.

BUCKEYE TELEPHONE and SUPPLY COMPANY
COLUMBUS 6, OHIO

Speakers Praise Spirit Of Telephone Workers

The New Century Club of West Chester, Pa., held a meeting on March 1 at which representatives of the Bell Telephone Co. of Pennsylvania showed pictures and introduced speakers who explained the know-how of telephony and paid tribute to telephone workers and their fine spirit of cooperation, loyalty, energy and patience which helps make possible the flow of conversation over telephone wires which was described as "America's favorite diversion."

In an announcement of the meeting, the West Chester (Pa.) *Local News*, in paying tribute to linemen said, "Forgetful of everything but his duty, he goes on making connections in a way which would amaze a novice, insuring service to the banker, the trainman, the grocer, the detective and the coroner, who want to get their messages through and want it 'PDQ'."

Of the operators it said, "Of course, there are superintendents and managers and presidents and things like that, all of whom doff their derbies to the silent girl at the switchboard, whom the public is so apt to overlook. Flood and fire, cyclone and disaster are all one to her. She says 'please' and connects the subscriber with his friend at the other end of the line."

V V

Telephone Scenes Are Hardest for Actors

Toughest test for an actor is a telephone scene, because there's never anyone on the other end of the line, according to a report of March 10. Directors don't like them, but sometimes they're necessary to carry the story along. Few people use them as dramatic highlights, as Luise Rainer did in "The Great Ziegfeld," for which she got an academy award.

Robert Young, working on "Those Endearing Young Charms," says he's solved the problem — he thinks. He writes out his lines, then writes in lines for the imaginary little girl who isn't there, and learns both ends of the conversation. It spaces the pauses properly and gives him better expression when he speaks.

WANTED TO BUY

WANTED TO BUY: Telephone company in California. Will pay cash. Write Box No. 2149, c/o TELEPHONY.

WANTED: One cordless PBX switchboard for local manual service with three trunk circuits and 10 station line circuits. This switchboard must be in good condition. Write Columbus Telephone Co., Inc., Whiteville, N. C.

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO.

DISTRIBUTED THROUGH JOBBERS

TELEPHONE ACCESSORIES

DROP WIRE CLIPS

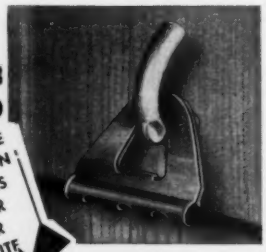
The Kearney Drop Wire Clips grip the drop wire over the entire length of the clip, thus avoiding spot loading. It encloses the wire within its two sides so that the drop wire can never become disengaged from the clip.

Quickly Installed with Ordinary Pliers

1 INSERT THE WIRE

2 CLOSE THE CUP CRIMP OVER FASTENER

3 A NEAT JOB COMPLETED



FOR COMPLETE INFORMATION AND PRICES SEE YOUR JOBBER OR WRITE

JAMES R. KEARNEY CORPORATION
4236 CLAYTON AVE., ST. LOUIS, (10) MO.

Index to Advertisers

	Page
Acme Visible Records, Inc.	—
Acorn Insulated Wire Co., Inc.	—
Addressograph Multigraph Corp.	—
Air Reduction Sales Co.	—
American Appraisal Co., The	—
American Coach and Body Co., The	—
American Condenser Corp.	—
American Creosote Works, Inc.	—
American Crossarm & Conduit Co.	—
American Cross-Arm, Inc.	—
American Fork & Hoe Co., Inc.	—
American Steel & Wire Co.	—
American Telephone & Telegraph Co.	—
Armstrong Cork Co., Whitall Tatum Glass Insulators Dept.	7
Atlantic Creosoting Co., Inc.	44
Audio Development Co.	—
Automatic Electric Sales Corp.	10, 21, 24-25, 47
Barco Manufacturing Co.	—
Bartlett Mfg. Co.	—
Benwood Linze Co.	23
Berry & Co., L. M.	—
Bethlehem Steel Co.	—
Brach Mfg. Co., L. S.	—
Buckeye Telephone & Supply Co.	45
Buckingham Mfg. Co., W. H.	—
Cable Spinning Equipment Co., The	—
Calculagraph Company	—
Carney & Co., B. J.	44
Chance Co., A. B.	—
Christiansen Co., C. M.	44
Churchill Cabinet Co.	—
Coffing Hoist Co.	—
Colfax Lumber Co.	—
Connecticut Telephone & Electric Div.	—
Cook Electric Company	19
Cope, Inc., T. J.	6
Copperweld Steel Co.	—
Cuneo Press, Inc., The	—
Davison Chemical Corp., The	—
Defiance Alloyed Products Co.	—
Dicke Tool Co.	—
Donnelley & Sons, R. R.	—
Eby, Inc., Hugh H.	—
Ederer, Inc.	—
Electric Products Co., The	—
Electric Storage Battery Co., The	—
Estwing Mfg. Co.	—
Everstick Anchor Co.	—
Fahnestock Mfg. Co., Inc.	31
Forged Steel Products Co.	—
Four Wheel Drive Auto Co., The	33
Fowle & Co., Frank F.	44
Gary Service & Investment Co.	31
General Cable Corp.	21
General Electric Co.	—
General Telephone Directory Co.	—
Graybar Electric Co., The	37
Gray Manufacturing Co., The	—
Hallicrafters Company	—
Hammond Drierite Co., W. A.	7
Herdrich Boggs and Co.	44
Hexacon Electric Co.	—
Highway Trailer Co.	27
Hirsch Organization, Gustav	—
Holtzer-Cabot Electric Co.	—
Homelite Corporation	29
Hubbard & Co.	—
Indiana Steel & Wire Co.	42
International Creosoting & Construction Co.	44
Jenkins Bros.	40
Johns-Manville	—
Joslyn Mfg. & Supply Co.	—
Ka-Mo Tools, Inc.	—
Kearney Corp., James R.	46
Kellogg Switchboard & Supply Co.	4-5, 6, 7
Kester Solder Corp.	6
Klein & Sons, Mathias	—
Leeds & Northrup Co.	—
Leich Sales Corporation	—
Lenz Electric Mfg. Co.	—
Line Material Co.	40
Linen Thread Co., Inc., The	42
Loomis Advertising Co.	—
Lorain Products Corporation, The	38
MacGillis & Gibbs Co.	44
Mathewson Company, E. B.	—
Matthews Corp., W. N.	—
Michigan Pole & Tie Co.	44
Morley Co., The	—
Moss Tie Co., T. J.	—
Murdock Co., Wm. J.	—
National Carbon Co., Inc.	6
National Fireproofing Co.	42
National Telephone Supply Co.	Back Cover
North Bros. Mfg. Co.	39
North Electric Mfg Co.	8-9, 11
Oliver Iron & Steel Corp.	—
Overton Co., S. E.	—
Owens-Illinois Glass Co., Hemingray Division	—
Page & Hill Co.	—
Paragon Electric Co.	—
Partridge Lumber Co., T. M.	—
Pensocalo Creosoting Co.	44
Phelps Dodge Copper Products Corp.	—
Philco Corp. (Battery Division)	6, 12
Plastic Wire & Cable Corp.	—
Porcelain Products, Inc.	—
Premax Products, Inc.	—
Raytheon Mfg. Co.	—
Ray-O-Vac Company	—
Rebuilt Electric Equipment Co.	—
Reliable Electric Co.	—
Remington Rand, Inc.	—
Rhodes & Sons, M. M.	—
Roeblings Sons Co., John A.	41
Runzel Cord & Wire Co.	—
Schauer Machine Co., The	—
Schollhorn Co., Wm., The	43
Seymour Smith & Sons, Inc.	—
Sloan and Cook	44
Stromberg-Carlson Company	2-3
Suttle Equipment Co.	—
Sylvania Electric Products, Inc.	—
Taylor-Colquitt Co., The	—
Templeton, Kenly & Co.	—
Toeppen, Manfred K.	44
United States Motors Corp.	—
Vulcan Electric Co.	6
Webster Electric Co.	—
Western Electric Co.	—
Weston Electric Instrument Corp.	—
Whitney Blake Co.	35
Williams, A. W., Inspection Co.	44
Wiremold Co., The	—
Wood Preserving Division Koppers Company	—
Wray & Co., J. G.	44
York-Hoover Corp.	—

Page
40
—
—
—
46
-5, 6, 7
6
—
—
—
—
40
42
—
38
44
—
—
44
—
—
—
6
42
Cover
39
8-9, 11
—
—
—
—
—
—
—
—
44
—
6, 12
—
—
—
—
—
—
—
—
—
41
—
—
43
—
44
2-3
—
—
—
—
44
—
6
—
—
—
35
44
—
—
44
—

HONY